Chemical Week

May 26, 1956

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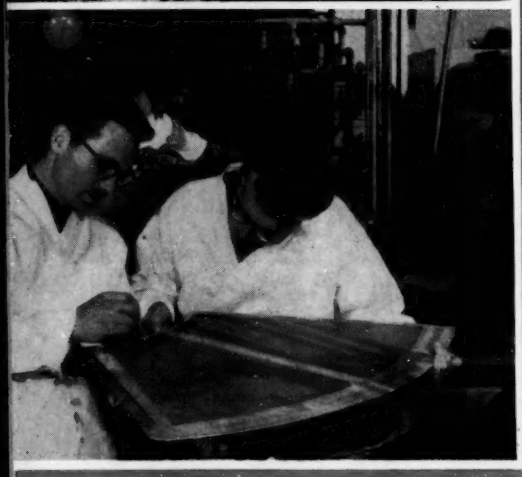

AEC is looking to industry for $50 million worth of new uranium production capacity . . . . . p. 17

Will your export markets be threatened by the growing strength of foreign joint ventures? . . p. 26

Fouled fishermen's nets may cost Crown Zellerbach more millions for pollution control . . . . p. 42

CMRA scans future for market impact of atom, turbine engines, synthetic "natural" rubber . . p. 98

They whip hard-to-work titanium into shape by etching. Result: cheaper aircraft parts . . . p. 60

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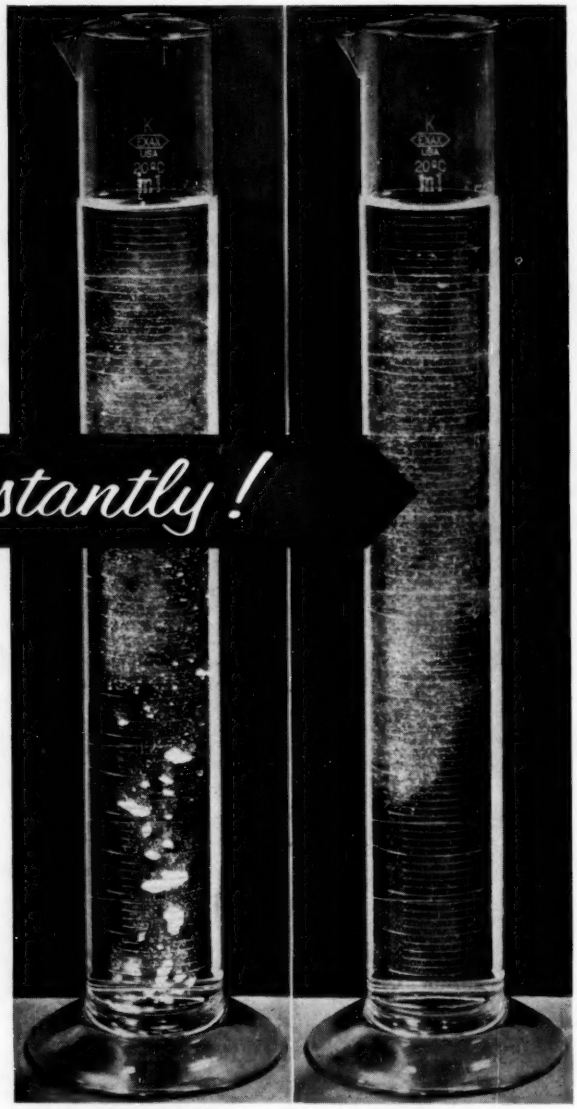

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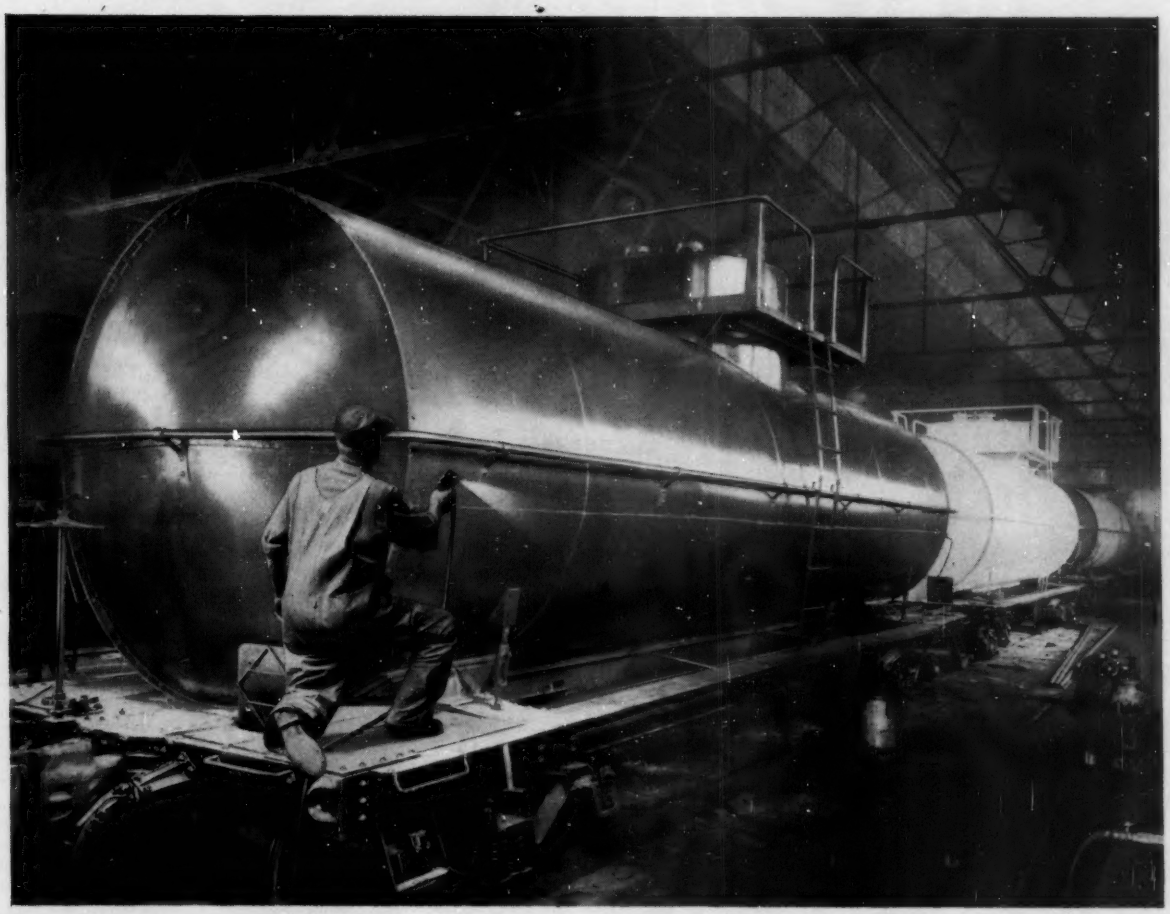
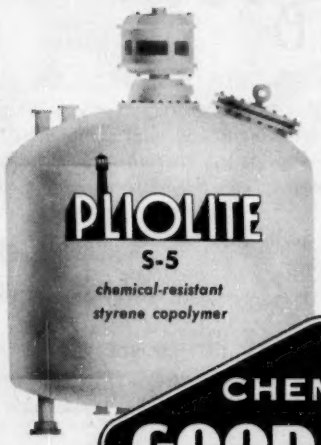


How to knock corrosion out cold



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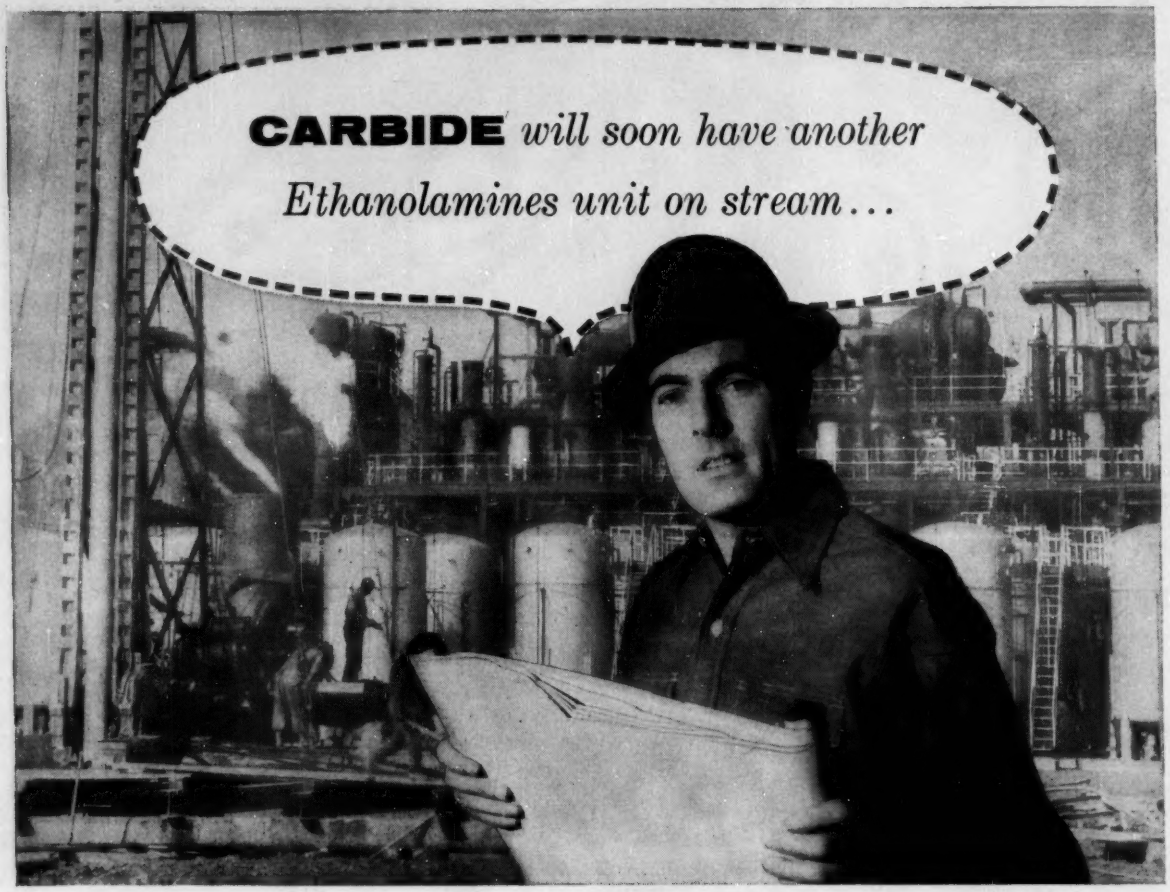

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Chemical Week

TOP OF THE WEEK

May 26, 1956

Just how good was business in 1955? Here's the answer in the first official '55 figures on the chemical industry p. 19

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Chemical Week

May 26, 1956 *Vol. 78, No. 21*

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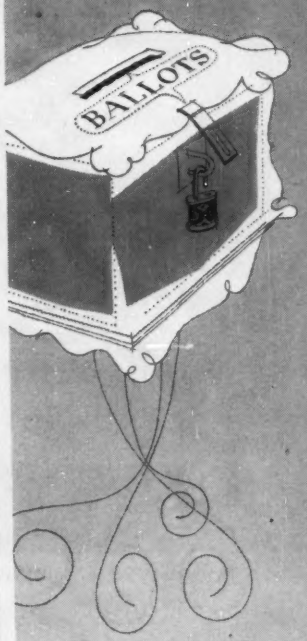

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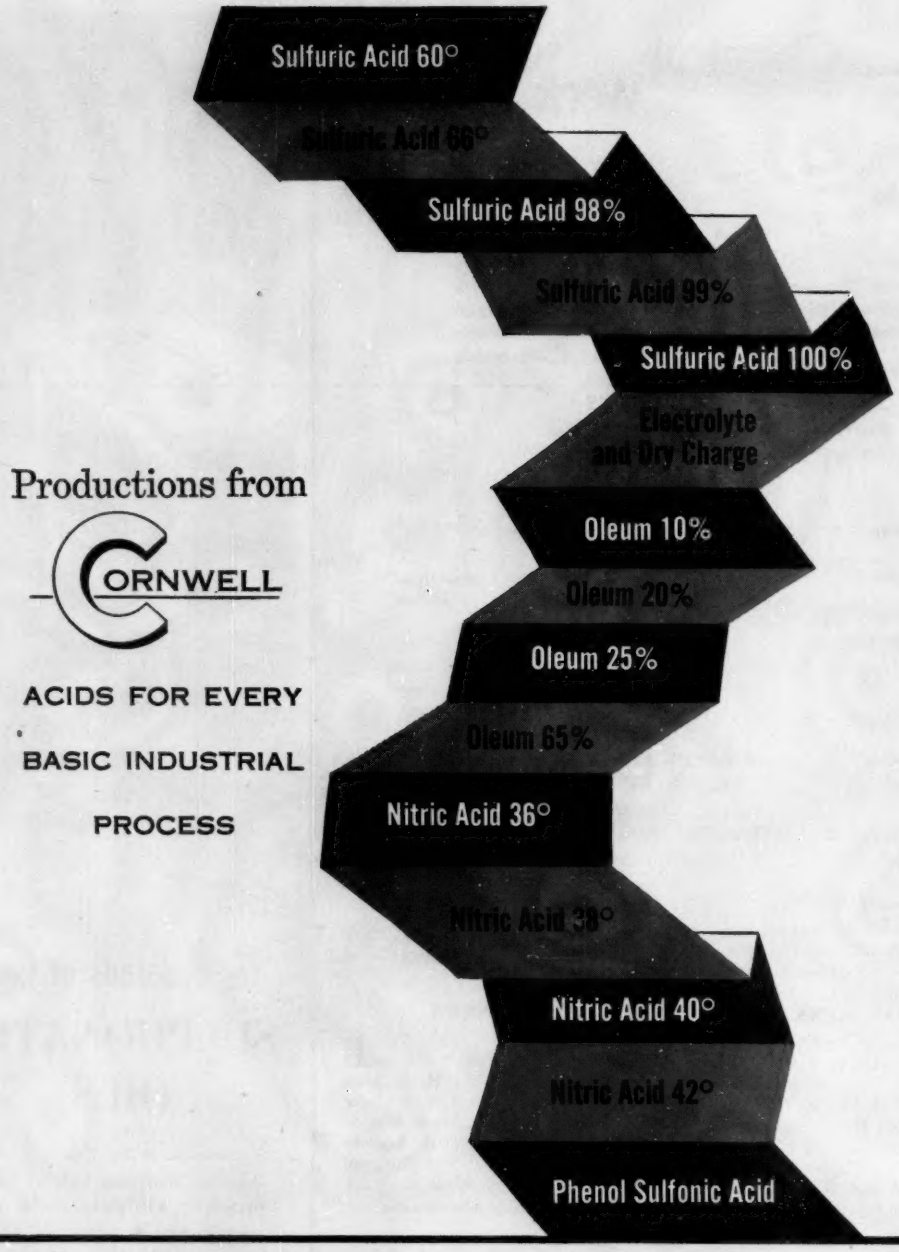

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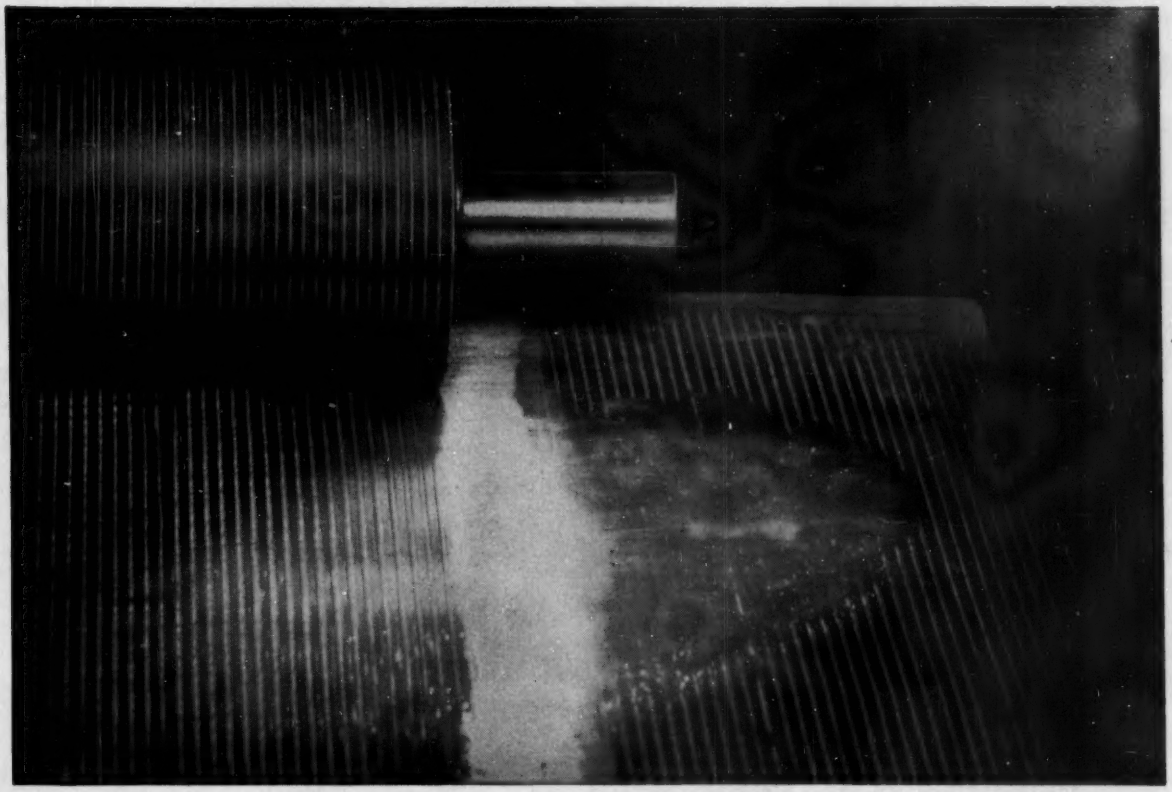

"Hot set" adhesives made with Methocel (left) remain on the surface to be bonded—without Methocel (right) the hot adhesive penetrates the board.

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This hypothetical heat lamp set-up demonstrates what can happen to your glue line when heat is applied.

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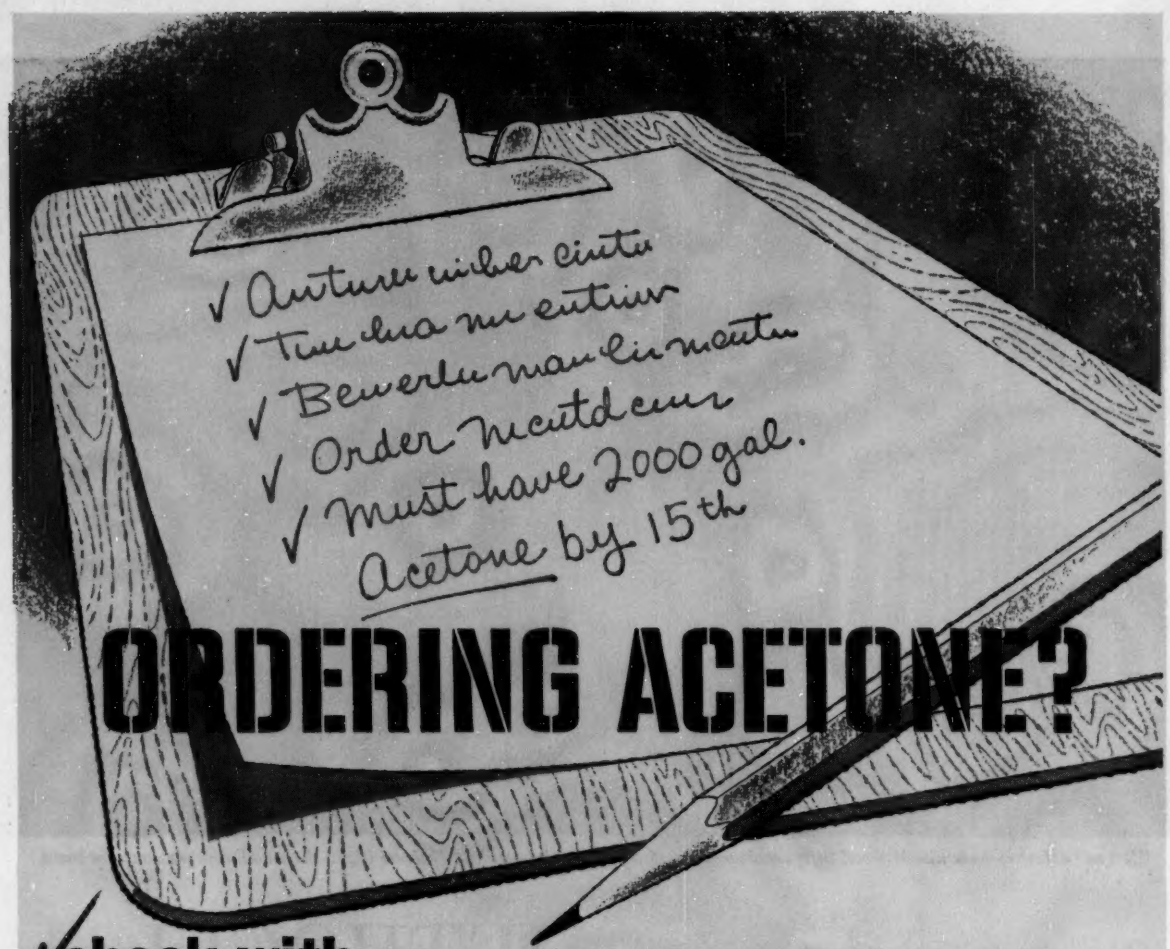

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Business
Newsletter

CHEMICAL WEEK
May 26, 1956

The steel industry wage negotiations, which begin next Monday, will have a substantial effect on chemical industry prosperity.

In the first place, these negotiations could set the pace for every other wage contract that expires or that can be reopened this year. And there are a lot of them—notably, the company-wide contracts covering aluminum and rubber workers. Many chemical companies will face contract sessions of their own.

Unions, in general, expect the steelworkers to get a hefty raise, either in pay or in fringe benefits. You can see this by the fact that they aren't pressing their demands yet. If other unions looked for a long strike by steelworkers, or for the granting of only a small wage increase, they would have pressed their own contract demands before this.

The unions' thinking: with steel demand as high as it is, the industry can't afford a strike, or a niggardly settlement.

Of course, this means a steel price increase. U. S. Steel's board chairman, Roger M. Blough, for example, described the coming negotiations as "the eleventh round of a wage-price spiral that began in the days of World War II and that now is just as much a part of spring as the robin or the rosebud."

And this means more inflationary pressures on chemical companies, which plan to spend $1,433 million on plant expansion this year (*CW, May 19, p. 16*).

But the trend toward inflation may be dampened if the anticipated business letdown occurs during the summer months. Virtually all the top businessmen who attended the semiannual meeting of the Commerce Dept.'s Business Advisory Council at Hot Springs, Va., last week forecast some sort of a downturn in the third quarter. But, for now, they see no reason for industry to cut back its long-range expansion plans.

•

A planned expansion became problematic this week as the government's Rubber Disposal Commission signed a contract to sell its 90,000-tons/year butadiene-from-alcohol plant at Louisville, Ky., to Union Carbide. Sale price: $3,125,000.

Carbide outbid Publicker Industries, which leased the plant a year ago and which planned an expansion of the plant—if it could buy it or negotiate a longer-term lease. Carbide's purchase (which still must be reviewed by the Justice Dept. and by Congress) is subject to Publicker's lease. Publicker won't have to vacate the plant until April '58, and meanwhile will pay a $6/ton fee to Carbide. There's nothing, however, that would bar Carbide from trying to get Publicker to surrender its lease before then.

What will Carbide do with the plant? It's not entirely sure, but a company spokesman indicates that it may continue manufacture of butadiene or other alcohol-derived materials.

The uranium mine that prospector Vernon J. Pick sold for $9 million to financier Floyd B. Odlum, president of the Atlas Corp., has uranium ore reserves worth only $4,083,750 in place. Mining and development costs would have to be paid out of this sum.

That startling fact, long rumored on the Colorado Plateau, was confirmed as Atlas filed an 85-page prospectus with the Securities & Exchange Commission. The prospectus reports that Pick's Delta mine has 135,000 tons of ore containing 0.35% uranium oxide; at the time of sale, the mine was said to have had 300,000 tons of such ore—a figure later hiked by Atlas to 600,000 tons. Mining operations have been going on at a 5,000-6,000-tons/month rate since July '55—but may be cut back to a 2,500-ton rate this month or next.

Pick, when queried, pointed out that SEC's required procedure for proving ore reserves had not been completed at the time of the sale. An Atlas Corp. spokesman reported that neither he nor any other employee of the company could comment outside the statements contained in the prospectus.

•

There are some big moves ahead in the detergent field. New heavy-duty liquid detergents are being introduced by Procter & Gamble and by Colgate, to compete with Lever's Wisk (*CW Business Newsletter, Feb. 4*).

Colgate says it's "several months" away from marketing its liquid heavy-duty, tentatively named Spree. P&G has introduced its Biz in three test markets, but may have moved too fast. There are indications—denied by P&G—that the product tends to separate and corrode.

Meanwhile, the first of the liquid heavy-duty materials, Armour's Gee, has been withdrawn from the market.

•

Virginia-Carolina Chemical management has hit back at the insurgent group under Rupert Zickl, which wants control of the Richmond, Va., firm. In a letter sent to stockholders last Saturday, President Joseph Howell charged that board members approved by Zickl and by management last July not only do not have "the slightest idea" of what changes in policy Zickl and associates desire for the company, but are also "completely without sympathy" for Zickl's action in demanding control.

Too, Howell says that former Virginia Governor John S. Battle, Sr., told him he was associated with Zickl only as "a country lawyer who has to make a living, and this looked like a good case." Battle's Charlottesville, Va., law firm is reportedly preparing a letter to stockholders that would explain Zickl's proposed changes in company policy.

Meanwhile, a stockholders committee is being formed by some minority holders of West End Chemical stock (*CW Business Newsletter, Feb. 19*) "to help management assess the value of any proposals" of merger received from Stauffer Chemical, or from others. The group emphasizes it will operate "in a positive manner."

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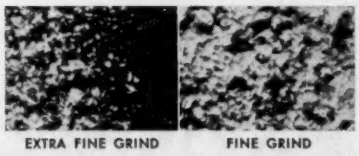
Air conditioning came to the rescue. Now we can make aluminum chloride, anhyd., all year long in a controlled dry atmosphere—so you can always get it at full strength, come rain or shine.



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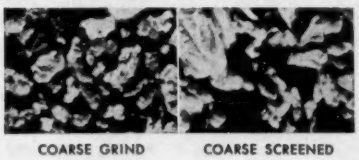

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And if you aren't a Hooker customer now, we hope these chemicals will give you two more reasons to become one.

In any case, the nearest Hooker sales office will gladly answer any questions you have about these and other Nialk products.

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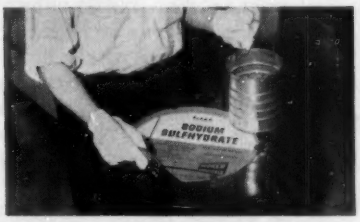

We package sulfides in brand-new steel drums with a 1/64-inch lining of lacquer to prevent iron pickup. We lacquer the drum lid, too, and secure it with six sturdy lugs so it stays airtight until you break the seal.

Extra caution is used before the sulfide goes into the drum. We control raw materials, using only our own caustic soda and hydrogen sulfide.

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For more information on chemicals mentioned here, check below:

- ☐ Aluminum Chloride, anhyd.
- ☐ Caustic Potash
- ☐ Carbonate of Potash
- ☐ Muriatic Acid
- ☐ Sodium Sulfhydrate
- ☐ Sodium Sulfide

Is your data file up-to-date on these other Hooker products in regular supply? Check for technical data:

- ☐ Benzoic Acid, U.S.P. & Tech.
- ☐ Sodium Benzoate, U.S.P. and Tech.
- ☐ Caustic Soda
- ☐ Lauryl Chloride
- ☐ Sulfur Dichloride
- ☐ Sulfur Monochloride

Clip and mail to us with your name, title, company address.

When requesting samples, please use business letterhead to help speed delivery.

HOOKER CHEMICALS & PLASTICS

HOOKER ELECTROCHEMICAL COMPANY

7052 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

NIAGARA FALLS · TACOMA · MONTAGUE, MICH. · NEW YORK · CHICAGO · LOS ANGELES

OPINION

Nutmeg County, Texas

DEAR HOWARD: Anyone with any political sense could have foreseen this [difficulty about interstate commerce] when the President vetoed the Harris-Fulbright bill. Now what to do about it?

I suggest a way out:

Two Connecticut men, namely Austin and Houston, stemmed from Connecticut, for which reason Texas should annex Connecticut as a small county. The sale of Texas gas in Nutmeg County would then be intrastate commerce . . . free and clear of FPC control. Northeast markets would be profitably opened to natural gas derivatives.

Nutmeggers could boast that they were from the biggest state in the Union.

Any objections, except that other Northern states would holler favoritism?

C. R. DOWNS
New York

Co-op Head Replies

DEAR MR. TRAENDLY: I have read the article, "Coping with Co-ops," in the April 14 issue of your magazine. I have no doubt that it accurately reports the frustration that many executives of big fertilizer companies feel.

It will not allay their frustration, I am sure, to point out that they are baying beside an empty tree. When these embattled individuals march on Congress, they will find these so-called "co-op tax advantages" to be simply figments of their own imagination. They will find no laws to repeal.

For many years, Congress has been pressured to tax co-ops as though they made a profit. Various groups, financed by just such men as you have interviewed, have sought to penalize co-ops by taxing as income the refunds they made to their customers. They hope thereby to force nonprofit business into the profit mold.

Repeatedly, Congress has refused to levy this punitive tax, primarily because the American people, whom they represent, are quite unwilling to force nonprofit, business-at-cost, co-op enterprise to pay a penalty tax over and above the taxes paid by other similarly situated businesses as the price of their existence in the United States.

Co-operatives will continue to resist such efforts, and we are confident we will have the vast majority of people with us. For they rightly understand that business need not be guided by profit to make a constructive contribution to our economic life.

It is useless, I presume, to point out that if any of the men you interviewed would arrange to refund their profits to their customers, they would be in exactly the same tax position as co-operatives. And if they had their customers' confidence, they too could get some of these refunds invested in their business. Co-ops have done this, and any other business is free to do exactly the same thing. But this means giving up profits and control to their customers.

Left-handedly, you have paid co-ops high tribute. Your article clearly shows that co-ops have brought down the cost of fertilizer to farm people. That is what we set out to do. For where profits are unreasonable, where service is poor or nonexistent, or where quality is low, co-ops have tried to overcome the failures of profit business.

Co-op fertilizer plants have not been built with "tax-free money," as one of the men interviewed thinks. Quite the contrary, they have been built with $100 shares that farm people bought so they could get better farm supplies at less cost. Here are organizations, denied access to the nation's great capital markets, that have literally raised tens of millions of dollars of private, risk-taking investment. Were it not for the economic predilections of your readers, I dare say you, too, would praise them for having done so.

Your article shows that co-ops match their private competitors "on the production, marketing, and distribution levels." We feel that co-op fertilizer research has also been tremendous, not only in product and process development but also in farm application of new knowledge. One of the men you interviewed challenges us, "without the profit system," "to attract and hold ambitious and imaginative individuals." That is the only real challenge, the only genuine thesis that yet remains to be proved or disproved. That challenge we gladly accept. For we feel sure that business-for-service-at-cost is quite as impelling a human motive as business-for-private-profit.

JERRY VOORHIS
Executive Director
The Cooperative League
Chicago

CW took no stand for or against co-ops. It simply reported a cross-section of fertilizer industry opinion. —ED.

SEE YOU THERE

International Committee of Scientific Management, The Royaumont Conference, Paris, France, June 2-3.

Materials Handling Institute's Exposition, new materials handling ideas and equipment on display, Public Auditorium, Cleveland, June 5-8.

American Society of Quality Control, 10th annual meeting, Le Palais du Commerce (the Show-Mart), Montreal, Canada, June 6-8.

National Plant Food Institute, 2nd annual convention, The Greenbrier, White Sulphur Springs, W. Va., June 10-13.

Society of the Plastics Industry, Inc., 7th national plastics exposition, new Coliseum; conference and meeting, Commodore Hotel, New York, June 11-15.

Armed Forces Chemical Assn., annual meeting, Hotel Somerset, Boston, June 14-15.

American Rocket Society-American Society of Mechanical Engineers, semi-annual meeting, sessions on liquid rockets, solid rockets, ramjets; Hotel Statler, Cleveland, June 17-21.

Second International Conference on Plant Protection, Fernhurst, Sussex, England, June 18-21.

American Mining Congress' metal mining industrial minerals convention and exposition, Shrine Exposition Hall, Los Angeles, Oct. 1-4.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

FOR MOST EFFICIENT, ECONOMICAL

Liquid Phase Adsorption

Specify

Pittsburgh Granular Carbon

If your job is to increase efficiency, reduce costs and produce higher product quality in a liquid phase adsorption process, then you'll want to know *more* about the unique benefits of using Pittsburgh Granular Activated Carbons in a fixed bed column system. Just look at these specific advantages:

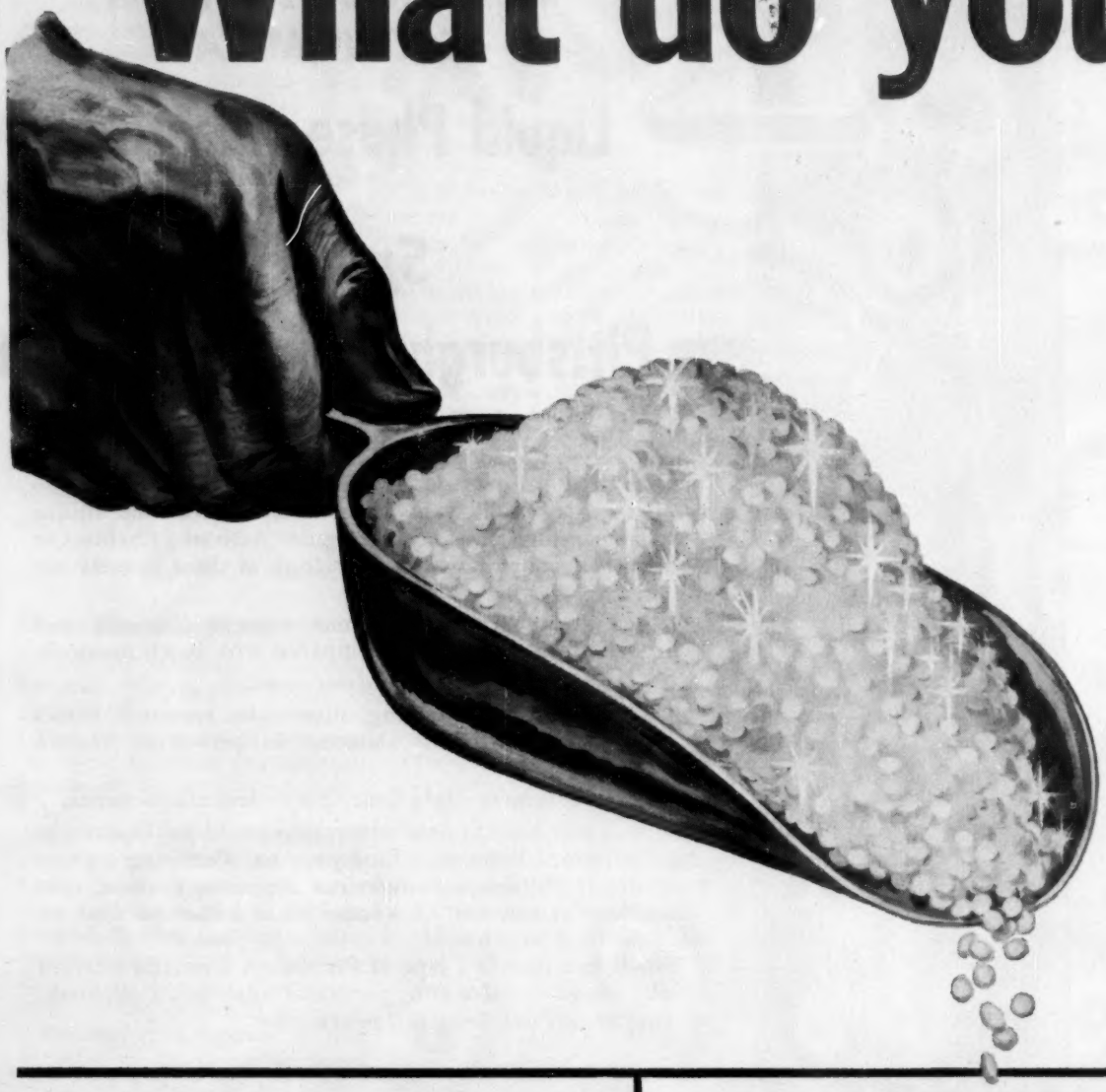
1. Far greater capacity, counter-current efficiency and higher product quality as compared with batch methods.
2. Lower carbon dosage—lower costs.
3. Elimination of slurrying, filter cake retention losses and dusting problems inherent in powdered carbon systems.
4. Less equipment—less floor space—less maintenance.

What's *your* liquid phase adsorption problem? Decolorizing a solution? Refining a food product? Purifying a pharmaceutical? *Pittsburgh coal-derived Activated Carbons, used in a column system, will do a better job at lower cost.* And we have the facts to prove it!

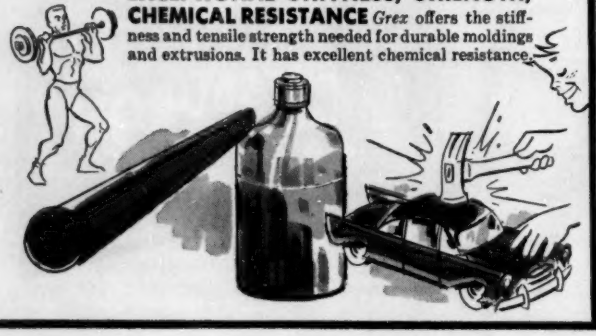
You'll find there's a type of Pittsburgh Granular Carbon ideally suited to solve your particular adsorption problem. *A letter or call will bring full information.*

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

What do you



EXCEPTIONAL STIFFNESS, STRENGTH, CHEMICAL RESISTANCE *Grex* offers the stiffness and tensile strength needed for durable moldings and extrusions. It has excellent chemical resistance.



GREATER HEAT, COLD RESISTANCE
Grex retains its original properties over a wide range of temperatures in moldings, extrusions and coatings.

make of this?

This is *Grex* linear polyethylene—first member of the great new family of *Grex* polyolefins.

Grex linear polyethylene opens broad new horizons for the plastics industry. It combines the traditional qualities of popular, conventional polyethylene with properties obtainable until now only in costlier, hard-to-work materials.

It has exceptional stiffness, superior tensile strength and good surface hardness. It will withstand boiling temperatures—even steam sterilization—and hard freezing. It bonds easily and securely. It colors readily. It is an excellent moisture-vapor barrier.

A hundred possibilities have been suggested for its use. Uncounted new applications will be developed for this remarkable resin and for its companion polyolefins.

To meet the vast demand for this versatile resin, Polymer Chemicals Division, W. R. Grace & Co., is now constructing a multimillion dollar chemical plant at Baton Rouge, Louisiana. Commercial production is scheduled for mid-'57. A fully-equipped applications research laboratory is already in operation. Evaluation samples will soon be available from our semi-works plant.

Meanwhile, *Grex* technical service experts will gladly cooperate with molders and extruders who express an early interest in this revolutionary new resin.

GREX*

THE PLASTICS RESIN OF TOMORROW

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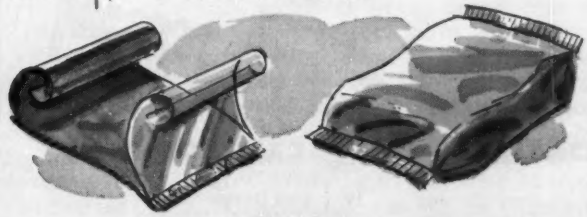
Grex provides a measurably more effective moisture-vapor barrier than conventional polyethylene for packaging and insulating uses.

READILY HEAT SEALABLE, TOO

Whether in self-sustaining film or laminated to papers and foils, *Grex* provides good "slip" for fast fabricating and good heat sealability for fast closing.



Continental's Perma-Lining gives 100% coverage plus uniform film thickness

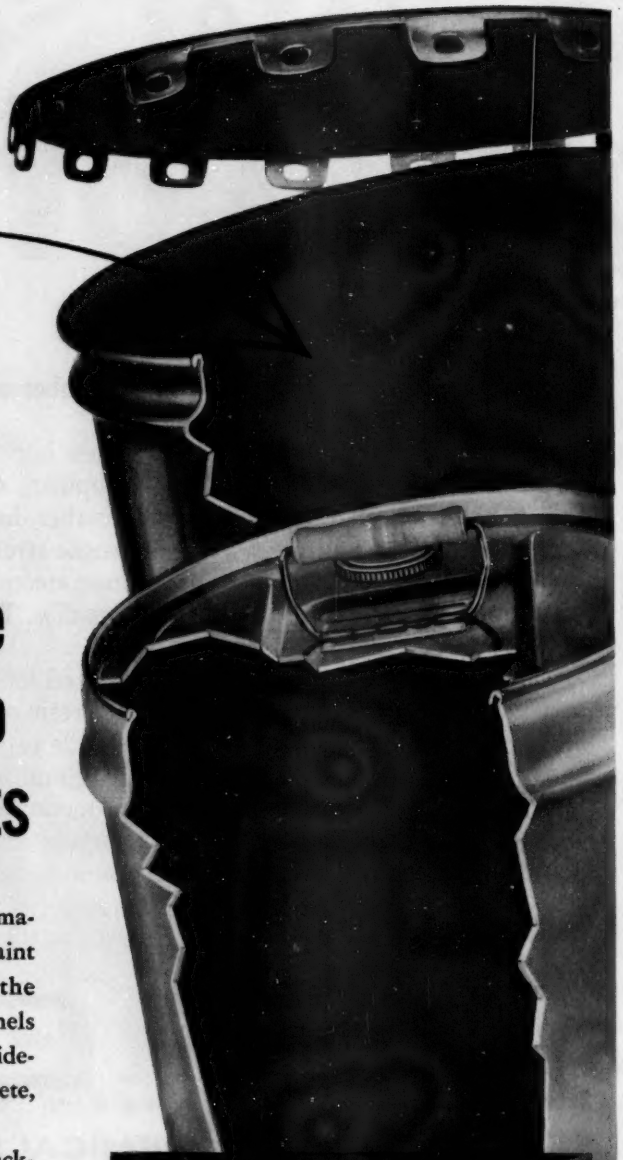
Continental's Perma-LINED steel containers give modern protection to hard-to-hold products

Now, the 100% protection of Continental's Perma-Lined steel containers is available for chemical, paint and petroleum products. Hot-sprayed within the formed container, and fast-baked, tough enamels cover every square-inch of inner surface. Even side- and bottom-seams, often a problem, get complete, uniform coverage.

Backed by our vast experience in tailor-made packaging, Continental Perma-Linings are available for almost every chemical, paint and petroleum product. In addition, our research department is fully prepared to develop new ones for your special use.

Why not put modern Perma-Lined steel containers to work for you? Just call your Continental representative.

TAILOR-MADE PACKAGE SERVICE



STEPPED-UP STORAGE TEST. Even after prolonged storage at 100°F., polyvinyl acetate glue fails to affect Perma-Linings. Never-ending research and testing by Continental scientists assures Perma-Lined steel containers of the highest quality.

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Eastern Division:	100 E. 42nd St., New York 17
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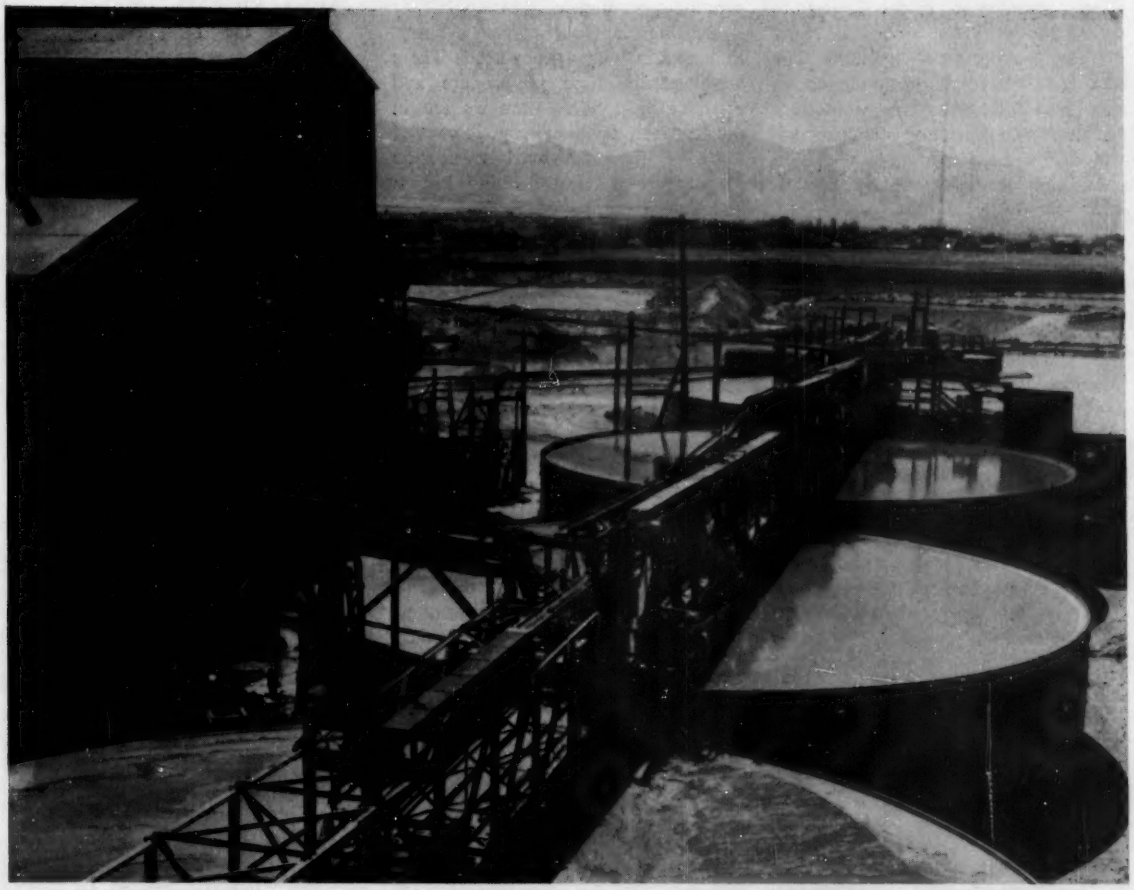


BIG LEACHING VATS, like these at Vitro's Salt Lake City plant, are in AEC's plans for new uranium processors.

Wanted: $50 Million in Uranium Plants

AEC will need 5,000 tons/year more uranium feed materials by '59 — and it wants new producers to help supply it.

So far, more than a half-dozen chemical companies are involved in planning proposals for plants that will comprise a new and privately owned uranium processing complex.

WHAT ONE top AEC official has termed "a future milestone in the development of private atomic energy in this country" loomed closer to reality last week as plans of two more groups to submit "proposals" for new uranium processing plants became known. On completion, the $50-million expansion will provide extra impetus to private atomic power projects, materially boost the chemical industry's stake in nuclear feed material production.

Vitro Corp. will team up with Goodrich Chemical in one bid (probable plant site: near Salt Lake City) and Union Carbide Nuclear will join forces with Catalytic Construction to submit another proposal. As revealed previously (*CW, May 12, p. 22*), Mallinckrodt and Climax Molybdenum are teaming up on a proposal.

AEC needs 5,000 tons/year of fluoride and oxide over the five-year period. It would like to give out two, or even three, contracts for separate plants whose combined production would add up somewhere near the figure—or it would probably settle for one large plant, if that is the best all-round proposal received.

The plant (or plants) would process uranium ores to uranium tetrafluoride and hexafluoride, as well as uranium

oxide (UO_3)—vital materials for AEC's present program, but also essential to peacetime uses of nuclear power.

Broaden the Base: AEC wants to interest newcomers in the project, to spread the work out among as many private producers as possible. The idea is to weave more atomic know-how into industry, thus promote a speedup in peacetime nuclear advances, while providing for AEC's continuing needs for processed uranium.

The commission has offered to train technical personnel (at company expense) and, since the company getting the nod would bear all costs, it would own all equipment and material involved. Pointing out incentives, AEC executive David Shaw said: "He [company] would have title to all information and patents developed by him and would be subject to no management control by the commission."

Other plants now producing intermediates in Fernald, O. (National Lead), St. Louis (Mallinckrodt), and Paducah, Ky. (Union Carbide Nuclear) are not operated in this way. The commission provides very strong support for each operation, pays for products on a cost-plus basis. The new contract would obligate the commission to buy material for a five-year period, at a fixed price—strictly a supplier-customer relationship.

Existing plants went up in a hurry, to meet AEC's emergency needs. There wasn't much time to prepare and consider bids. "This time we are in the fortunate position" says Shaw, "of knowing that we need a specific amount of material meeting known and measurable specifications, at a definite time far enough in the future to allow us to solicit private industry to build the facilities."

Down to a Dozen: AEC first revealed the need for a new processing plant in Nov. '55. At that time, more than 60 companies attended an orientation meeting, aimed at interesting industry in the project. A month or so later, the field narrowed to 25, and only a dozen companies sent representatives to the last conference.

Most companies dropped out because of reluctance to compete from scratch with "old timers" in the field. They felt that experienced uranium processors had too much of a head start—that it would be too expensive to catch up quickly. Too, the cost of preparing a proposal, and the engineering to be presented in competition with other companies, can run as high as $100,000.

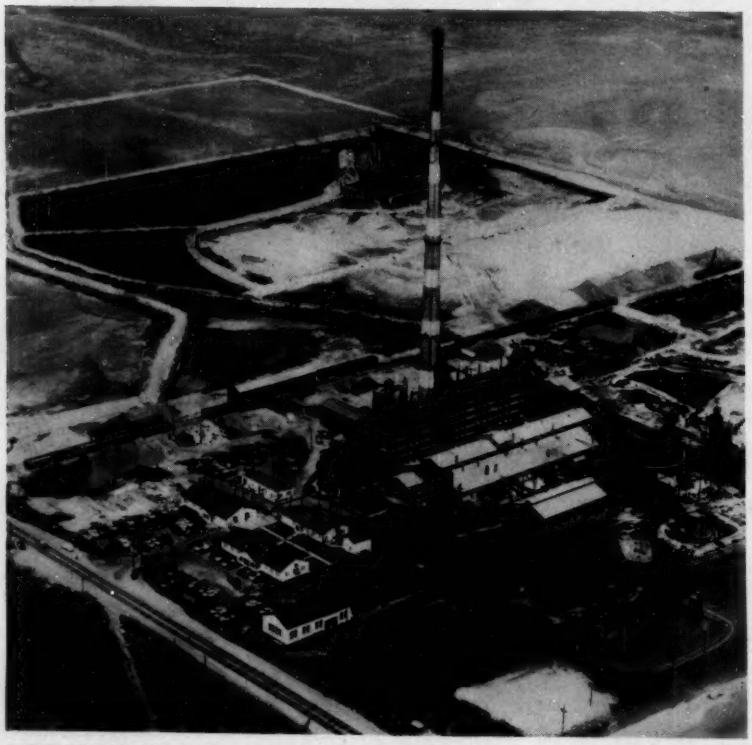
Remove the Temptation: In any case, the commission would prefer new blood. It might be an awkward situation if one of the companies now producing should land the new contract. Then it would be possible, for example, for that company to use the old plant for a cost-free research unit, passing new technological knowledge gained on to the new plant. In this way it could charge up the research to AEC as cost, at the same time cutting production costs substantially. But it would still be receiving the fixed price for feed materials at the new plant. AEC does not believe any of the companies would resort to this, but it would like, if possible, to remove the temptation.

This doesn't mean that companies now producing under old contracts will be barred from submitting proposals. Queried on the subject, Shaw answered: "I can conceive of a situation where a present operator, entering perhaps into a venture with someone else, at a site far isolated from the present operation, might make a proposal on a basis that would appear to offer no opportunity for the improper comingling of effort."

Apparently, such is the case with the Union Carbide Nuclear-Catalytic bid. Vitro, though not a "present operator," has still elected to make its proposals with Goodrich. And National Lead is rumored to be carrying out similar negotiations with a major chemical firm.

Besides those companies already mentioned, several may still submit bids. They include Anaconda Co., Grace Chemical, Atlantic Refining, Stauffer Chemical, Vanadium Corp. of America, Texas Co., New Jersey Zinc, Olin Mathieson and Uranium Reduction.

It will be some time before AEC makes the choice. (April 1, 1959, is the tentative deadline for delivery, with all bids to be in by Oct. 1, 1956.) And it's not realistic to expect a decision before the middle of Dec. '56. But, no matter which is chosen, the result will help promote an intensified atomic research program, with more emphasis on peacetime applications.



VITRO'S SALT LAKE CITY PLANT; For future producers, freer rein.

THE CHEMICAL INDUSTRY'S ANNUAL REPORT

Consolidated figures for U.S. corporations in the field of chemicals and allied products

Source: Federal Trade Commission, Securities & Exchange Commission

	Total, 1955*	1st Q	2nd Q	3rd Q	4th Q
Income and Surplus	Million Dollars	Percent of Sales			
Sales	$20,099	100.0	100.0	100.0	100.0
Net Operating Profit	2,982	14.6	14.7	15.3	14.7
Net Profit Before Taxes	3,160	15.0	15.3	16.4	16.2
Net Profit After Taxes	1,665	7.6	8.0	8.7	8.8
Earned Surplus, Surplus Reserves	24,043	36.2†	37.3†	36.9†	35.2†
Total Depreciation, Depletion	217	4.2	4.0	4.1	4.1
Assets		Percent of Assets			
Cash and Securities	3,051	16.2	16.6	16.8	17.4
Receivables	2,095	12.6	12.7	13.4	12.0
Current Assets	8,906	50.1	50.1	50.6	50.9
Total Assets	17,495	100.0	100.0	100.0	100.0
Liabilities, Owners' Equity					
Current Liabilities	3,288	17.3	16.1	17.1	18.8
Total Liabilities	5,825	31.3	30.2	31.7	33.3
Owners' Equity	11,672	68.7	69.8	68.3	66.7
Total Liabilities and Owners' Equity	17,495	100.0	100.0	100.0	100.0

*** Differing scope of survey accounts for variations from Commerce Dept. figures**
† as percent of assets

1955's Rocketing Sales

U.S. chemical and allied products manufacturers showed a healthy 15% gain in 1955 over the previous year, according to the Federal Trade and Securities & Exchange Commissions' annual financial report for U.S. manufacturing corporations, issued last week.

Tabulating the performance for a host of different industries in 1955, the report highlighted these points from chemicals and allied products producers:

• Sales climbed 15% from $17,535,000,000 in 1954 to $20,099,000,000 last year, while profits after federal income taxes spurted to $1,665,000,000, a 39% gain over '54. The $5,240,000,000 sales volume chalked up in the final three months of last year topped the previous quarter's sales by 6% and the fourth quarter of 1954 by 17%.

There were steady gains with each successive quarter. Profits after taxes rose from 7.3% of sales in 1954's last quarter to 7.6% in the first quarter of 1955; 8% in the April-June period, 8.7% in the July-September quarter and 8.8% in the final quarter of 1955. Profits before taxes showed an even higher gain—from 12.9% in the final quarter of 1954 to 16.2% a year later.

• The FTC-SEC report shows these operating ratios for chemical firms: Their annual rate of profit (after federal income taxes) amounted to 15.7% of sales at the end of 1955, up from the 12.5% ratio of a year earlier. Current assets at the end of '55 were 2.71 times as great as current liabilities, compared with 2.76 times at the end of '54 and the 1955 high—on June 30—of 3.12.

• The report showed significant differences in profitability, depending on the size of manufacturing enterprises. After taxes, profits amounted to 5.6¢ out of each sales dollar in the fourth quarter of '55 for manufacturers generally. But, this rate varied from ½¢ for firms with an annual volume of under $250,000 up to 8¢ for those doing $100 million or more in sales last year. The report showed a consistent pattern between these.

KAWECKI'S KAWECKI, CENERAZZO, VALERIANO: They've come . . .

From Basement to Boom

Hard on the heels of its acceptance for listing on the American Stock Exchange, six-year-old Kawecki Chemical Co. (Boyertown, Pa.) last week revealed an energetic growth program.

In addition to building a new tantalum plant (*CW, April 28, p. 62*), Kawecki will double output of titanium and zirconium double salts (master alloys). These products—which are used in electrolytic production of the metals—will be made by a new process that is said to yield hafnium-free potassium zirconium fluoride and zirconium oxide.

There are no customers yet for the zirconium double salts, but they shouldn't be hard to find. Zirconium, because it is a poor neutron absorber, is useful in nuclear reactors. Hafnium, a good neutron absorber, occurs naturally with zirconium, and it's always been a tricky problem to separate them effectively. Purity is vital because a trace of hafnium will cut down operating efficiency of the reactor.

AEC's method of eliminating hafnium from zirconium chemicals is by organic solvent extraction, but Kawecki relies on fractional crystallization. Says President Henry Kawecki: "It's an extremely simple method—one that will prove to be much less costly."

But AEC, apparently, is not yet interested, for Kawecki emphasizes that his company does not have a contract with the commission—nor does he foresee one in the near future.

Lithium Under Wraps: Besides the new zirconium process, Kawecki has just perfected a method to extract lithium. Details are still under wraps, but Kawecki assures *CW* that the method is practical and economical, with "absolutely no more development required." The rumor that Kawecki will put the new method to work in a lithium plant to be built jointly with a Canadian producer is only in the talking stage, company officials insist. Still, Kawecki researchers have spent a lot of time and money developing the process, and Kawecki admits they'd like to get into commercial production eventually.

Still in the planning stage is Kawecki's new niobium plant. No details are forthcoming, but an announcement is expected soon. And the firm is pilot-planting several other products, details of which cannot be pried loose.

Kawecki quit a $12,000/year job with Beryllium Corp. six years ago to devote full time to double-salt experiments in his basement lab. A few weeks thereafter, Phillip (Flip) Valeriano and Joseph Abeles came in with him.

Total investment by the three: $25,000. They purchased out-of-the-way acreage on the outskirts of Boyertown, Pa., and moved the business into a discarded tool shed on the partly wooded, 30-acre site. For the first few weeks in their new office, they couldn't afford any heat. But the Pennsylvania winter prevailed, leading to the purchase of a small, pot-bellied coal stove. "It was better than nothing, I guess," says Valeriano.

Many times, during these months, they worked around the clock—often taking turns sleeping in their combination office-laboratory-plant. And, to save money, the containers in which raw materials arrived were reused for outgoing shipments.

But business improved. Profits for the first year were $13,400, on sales of $165,000. By the second year, sales were up to $284,000 and profits had risen to $14,300. By 1952, the company's net income was $23,000—safely in the black.

Assistant Treasurer John Cenerazzo points out one reason for this rise: Kawecki's decision to produce high-purity selenium, which has found a burgeoning use in rectifiers. Too, the firm purifies selenium scrap for electronics companies on a contract basis.

Sixteen buildings now dot Kawecki's site. Its sales last year totalled a comfortable $2 million—profits, almost $200,000.

Kawecki's rise has not been overlooked by Wall Street. The company's first public stock issue, floated in Nov. '55 at 11½, has almost tripled in six months. It now ranges about 31½ and, because it is held in relatively small blocks, is actively traded. (Some Wall Street men who manage relatively large investment portfolios say they would be interested in investing in Kawecki—but are unable to get enough of the stock to make such an investment worthwhile.)

Henry Kawecki admits it was a gamble at the beginning; but both he and everyone working with him believe that much of the company's growth is still ahead.

Washington Angles »

» **Four companies plan nickel ante**—that's the word from Defense Mobilizer Arthur Flemming. He's considering the granting of fast tax write-offs for a further expansion of nickel production to meet possible war needs. The companies that may apply: Freeport Sulphur, Bethlehem Steel, International Nickel, and Farnbridge, Ltd.

Flemming is reportedly about to approve an expansion that would give tax aid to a 140-million-lbs./year expansion of nickel capacity.

» **New life for an electrochemical center** may be ahead because of a recent Congressional action. Congressmen okayed a provision to let the Tennessee Valley Authority use its own revenues to construct new steam generating plants.

» **Feed additive use** is getting new encouragement from Agriculture Dept. scientists. The experts point to a 25% boost in weight of poultry through extensive use of urea, antibiotics and diethyl stilbestrol—which can lead to a 58% rise in net profit per bird.

» **The battery additive fight is over.** After years of hearings and litigation the Federal Trade Commission cleared Pioneers, Inc., of a charge that the company falsely advertised its AD-X2 battery additive.

While the greater weight of scientific testimony was against the claims, FTC ruled, the "overwhelming" weight of consumer testimony backed the ad claims.

EXPANSION

Vinyl Resins: General Tire & Rubber Co. has started an expansion of its resin plant near Ashtabula, O., that will boost the company's vinyl production 50%—to about 38 million lbs. annually.

•

Aminotriazole: North American Cyanamid Co., Ltd., has begun construction of a unit for the production of aminotriazole at the company's Welland, Ont., plant. The new facilities will triple production capacity for the material by 1957.

•

Sulfuric Acid: Best Fertilizers Co. will undertake a $1-million sulfuric acid expansion project in San Joaquin County, Calif. When complete, the new unit will produce 200 tons/day.

•

Pulp and Paper: Bowater Southern Paper Corp. will go ahead with its plans to build a 400-tons/day pulp and paper plant in York County, South Carolina. The S. C. Water Pollution Authority has given the green light for waste disposal in the Catawba River.

•

Petroleum Aromatics: Richfield Oil Corp. is building a $10-million catalytic reforming unit at Long Beach, Calif.

•

Benzene, Toluene, Xylene: Canadian Oil Companies Ltd. will build a $3-million extraction and platforming unit at its Sarnia, Ont., refinery. Capacities: extraction, 3,650 bbls./day; platforming, 4,400 bbls./day.

•

Sulfonates: Alox Corp. will start a $1-million expansion at Niagara Falls, Ont., for the manufacture of petroleum sulfonates, synthetic sulfonates, lithium-base lubricants and synthetic lubricants.

•

Tetra-ethyl Lead/Vinyl Chloride: Ethyl Corp. will build a multimillion-dollar vinyl chloride monomer plant at Baton Rouge, La. The company has options on land at Joliet, Ill., as a possible location for facilities to produce tetra-ethyl lead.

•

Cement: Medusa Portland Cement will construct a $12-million cement plant near Wampum, Pa. Scheduled for completion in the latter half of 1957, the plant's capacity will be 2.5 million bbls./year.

• Universal Atlas Cement has reached agreement with Baltimore & Ohio Railroad for purchase of 34 acres of land at Lorain, O., as the site of a proposed cement plant.

•

Butadiene: Humble Oil and Refining will expand its butadiene plant at Baytown, Tex., to raise capacity from 49,000 to 65,000 tons/year, with completion scheduled for early 1957.

•

Ilmenite: Union Carbide and Carbon Co. has bought a 56-acre, $31,416 tract of land from the city of Fernandina Beach, Fla. The company will mine the land's titanium-bearing sands.

•

Resins: Stein, Hall & Co., Inc., will build a $250,000 resin and textile chemicals plant at Charlotte, N.C. Construction is expected to be completed at the end of 1956.

COMPANIES

Montgary Explorations, Ltd., has acquired 58% of the outstanding stock of Alox Corp. (Niagara Falls, Ont.) for $650,000. Montgary now controls 99% of Alox stock, since a Montgary subsidiary already owns 41% of Alox.

•

Thiokol Chemical Corp. has received a deed to one-half of the mineral rights on part of a 10,000-acre tract where it will build a rocket and guided missile production plant and research center at Connors Springs, near Corrine, Calif.

•

Delhi-Taylor Oil Corp. is completing preliminary financing of its proposed $15-20-million potash mining and beneficiation development properties at Moab, Utah (*CW Business Newsletter, April 12*).

•

Textron, Inc. (the company once known as Textron American, Inc.) wants to split its textile and nontextile

"Buffalo"

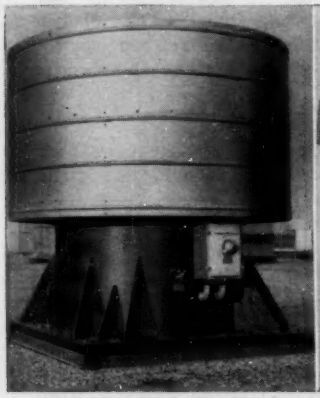
SKY-VENT ROOF VENTILATORS

CAPACITIES: 1,000 cfm through 250,000 cfm

SIZES: 12″ through 120″

"Buffalo" high volume power roof ventilators are designed to ventilate large plant areas not adjacent to outside walls or where expensive and bulky duct work is impractical. This type of ventilation lends itself well to rearrangement of plant layout without consideration for the ventilating system.

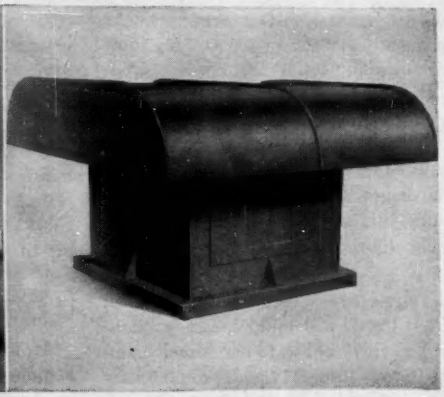
The "Buffalo" Propeller or Axial Type Fan in the stack has all the strength, efficiency and smooth operation that characterizes the "Q" Factor* in all "Buffalo" Fans. Recently introduced, these new units are being adopted by many of the country's largest plants for removing hot air, fumes and fogs from large areas. Why not investigate? Write today on your company letterhead for Bulletin FM-1234 and other descriptive material.



Style "V" Sky-Vent

Counterbalanced dampers open when fan starts, close by gravity over V-shaped trough at top of inner cylinder when fan is shut off. Heavy gage stack contains integrally welded gussets supporting motor and propeller fan. Outside gussets provide rigidity, minimize vibration. For easy installation, a flanged roof curbing plate is welded to the stack.

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*



Style "H" Sky-Vent

The Style "H" Sky-Vent head is made of heavy gage galvanized steel with integrally rolled stiffening flanges along its entire length and is internally braced with one-piece welded square hollow tubular frame. Hood design minimizes friction loss as air leaves unit.

The extra heavy galvanized steel stack with integral flanged curb plate has offset stiffening panels rolled into the side sheets and on larger sizes is further braced with one-piece welded square hollow tubular frame. Gravity, manual or motor operated shutters are available, mounted in the stack. Disconnect switch and internal wiring can be provided.

BUFFALO FORGE COMPANY
BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

INDUSTRIAL EXHAUSTERS BELTED VENT SETS PROPELLER FANS "E" BLOWERS-EXHAUSTERS

businesses. The textile business would be conducted by the Amerotron Corp. Textron would continue making plywood and plastic materials. The split would give stockholders one share of Amerotron for each share of Textron they hold. Final action is subject to stockholder approval and a favorable tax ruling by the Internal Revenue Service.

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Certain-teed Products Corp. will transfer its gypsum and paper business to the newly formed Bestwall Gypsum Co. Subject to stockholder approval, Certain-teed owners will get one share of Bestwall for every three Certain-teed shares held.

•

Union Bay State Chemical Co. (Cambridge, Mass.) has changed its name to UBS Chemical Corp.

FOREIGN . . . . .

Dolomite/Iraq: Commercial quantities of dolomite, for use in water treatment, were recently discovered in the Ain-Safra area of Iraq, 16 miles east of Mosul City. The first dolomite discovery of commercial significance in Iraq, it was made by the Iraq government's Laboratories of the Industries Dept. The government Oil Refineries Administration has taken over the area for large-scale exploitation.

•

Lithium/Africa: African lithium capacity increased substantially with opening of the newly expanded lithium salts extraction plant at Gwelo, Southern Rhodesia. The complete plant now represents a $280,000 investment, triples the original plant's capacity. Ore output for the country is now about 6,150 tons/month as against last year's 5,000.

•

Carbon Black/Australia: Shell and United Carbon Co. will build a $5-million carbon black plant adjacent to existing Shell works at Geelong, Victoria, Australia. Until now, Australia imported carbon black.

•

Fischer - Tropsch/Africa: South Africa's new synthesis plant, Sasol, will be producing only one thirtieth of the Union's liquid fuel requirements by 1965, says the firm's chairman, F. J. Du Toit, adding that the Union must plan and build several more oil-from-coal plants if it hopes to be self-sufficient within the next 10 years.

"Many customers report our new 'shotted' urea fits their needs perfectly"

"This free-flowing form of Du Pont Urea has permitted quite a number of users in my area to simplify and speed up processing." This report from Du Pont Polychemicals representative Bob Harbour is typical of comments received during recent months.

An evaluation of Du Pont Shotted Urea in your operations may prove to be the answer to one of your processing problems. Or if you require urea in its crystalline form, remember that Du Pont Crystal Urea still sets the standard for purity for *all* industrial chemicals . . . no other chemical product sold in tonnage lots has higher purity.

Few other chemicals, too, have a wider range of applications than Du Pont Urea. Urea-formaldehyde resin adhesives... wet-strength coatings... textile sizes and finishes... and urea-formaldehyde molding compositions are a few of the principal uses for this versatile chemical. Strict adherence to rigid specifications assures the user of dependable purity and uniformity.

In order to speed deliveries to you, Du Pont is currently expanding its distribution facilities. Prompt shipments can now be made from a number of stock points strategically located throughout the country.

We have information about Du Pont Crystal Urea and Du Pont Shotted Urea which may be helpful to you. Simply use the coupon and we will send it on to you promptly.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

BOB HARBOUR is sales representative for the Du Pont Polychemicals Dept. in northeastern Ohio, western Pennsylvania and western New York. Bob, a graduate chemical engineer from Ohio State, has had extensive experience in serving the chemical process industries. Like his fellow salesmen, Bob is equipped to work closely with customers in determining individual chemical requirements.

FOR ADDITIONAL INFORMATION ON SPECIFICATIONS, PROPERTIES AND USES, MAIL THIS COUPON

Which of these other chemicals are you interesfed in?

- ☐ ADIPIC ACID
- ☐ DIGLYCOLIC ACID
- ☐ HYDROXYACETIC ACID
- ☐ HYTROL® O CYCLOHEXANONE
- ☐ LOROL® FATTY ALCOHOLS
- ☐ METHANOL

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 605, Wilmington 98, Del.

Please send me full information on Du Pont Crystal Urea and Shotted Urea. I am particularly interested in evaluating these products for the following applications:

_____

_____

Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

PRODUCTS OF GRAIN MILLERS
from Minnesota, Missouri and
Kansas are shipped to market daily on
express-speed "Early Birds"

One day faster to the East—

for any product—via the "Early Birds"—at no extra cost

Sacks of flour for the baking industry, packaged flour for supermarkets and corner grocers arrive *one day faster and fresher* at terminal markets in Buffalo, Boston and New York—when shipped via New York Central "Early Birds."

The saving of one day's shipping time means inventories, warehouse space and personnel are reduced at destination points. Less capital and interest is tied up in perishable commodities. Shipments arrive in excellent condition, with less shrinkage and spoilage. The cost of insurance is reduced.

Freight cars arriving from west of the Mississippi and south of the Ohio Rivers merge with the "Early Bird" fleet at East St. Louis, Peoria, Chicago and Cincinnati Gateways. Local-origin freight departs on "Early Birds" from East St. Louis, Peoria, Chicago, Detroit, Cleveland, Cincinnati and Indianapolis for Buffalo, Boston and New York.

No matter if you ship perishables or general freight, routing shipments via New York Central's "Early Birds" means finer, faster service. Ask your New York Central Freight Salesman to show you how the "Early Birds" can serve your needs.

Now . . . three more "EARLY BIRDS"

CHICAGO to BALTIMORE . . .
DETROIT to BALTIMORE . . .
Between
CINCINNATI and DETROIT

Shippers and receivers can now save a day by routing freight via "Early Bird" service from Chicago and Detroit to Baltimore.

"Early Bird" fast, straight-through service between Cincinnati and Detroit (both ways) saves seven hours in shipping time.

New York Central System

Route of the "EARLY BIRDS"—the one day faster freight service

General Offices: 466 Lexington Avenue, New York 17, N. Y.

Dow-Sponsored Educational Opportunities

Company's three-way program seeks penetration of school levels, provides:

For Employees

- Extension courses in such fields as Business Administration, Chemistry, Chemical Engineering, Metallurgy, Mathematics.
- Subsidized graduate work in similar fields at school near division headquarters.

For Students

- Scholarships in college-level science and engineering.
- In-plant summer job experience and special training.
- Research fellowships.

For Teachers

- In-plant summer experience and training.
- Postgraduate scholarships.

Three-Way Manpower Plan

In the next few weeks, up to 10 local high school science teachers will start their summer vacations—working—in plants of Dow Chemical Co.'s Texas Division. As part-time employees of Dow, they'll be participating in the company's three-pronged education program—for employees, students and teachers—designed to encourage and stimulate growth of potential in scientific and technical fields.

While an increasing number of chemical companies will be carrying on various kinds of aid-to-education activities this year, Dow feels that its plan is specific in that it's designed to meet the company's own medium-long-range needs for scientific and engineering personnel. After long study and trials by the industrial relations department, the Texas Division has put into effect a continuing program that aims at three objectives:

- Encourage educational growth of present Dow employees through subsidized or company-backed education.
- Promote interest of more high school and college students in science careers.
- Provide practical experience and educational aid for high school science teachers, who, in turn, may foster more student interest.

Employee Training: For its present full-time employees, the division has initiated a series of courses in the plant community utilizing the services of Texas A&M faculty members. Under this plan, employees sign up for evening classes leading to four-year and graduate degrees. On the graduate level, Dow gives a 12-week leave of absence that includes the student's regular vacation for required studies on the campus. Participation in this graduate studies program since the first class in 1954:

- 26 chemical engineers took a course in distillation.
- 23 chemical engineers enrolled in a heat transfer course.
- 29 chemical engineers signed up for a kinetics course.
- 27 chemical engineers and 31 chemists studied advanced organics.

Student Careers: As a means of inducing students in high schools and colleges to enter engineering and science fields, Dow provides several scholarship and fellowship funds. Each year, six $200 scholarships go to students who have finished their freshman year in chemistry or chemical engineering at the U. of T., Texas A&M and Rice Institute. Eight other scholarships go to local high school graduates planning to pursue college studies in recognized science or engineering curricula.

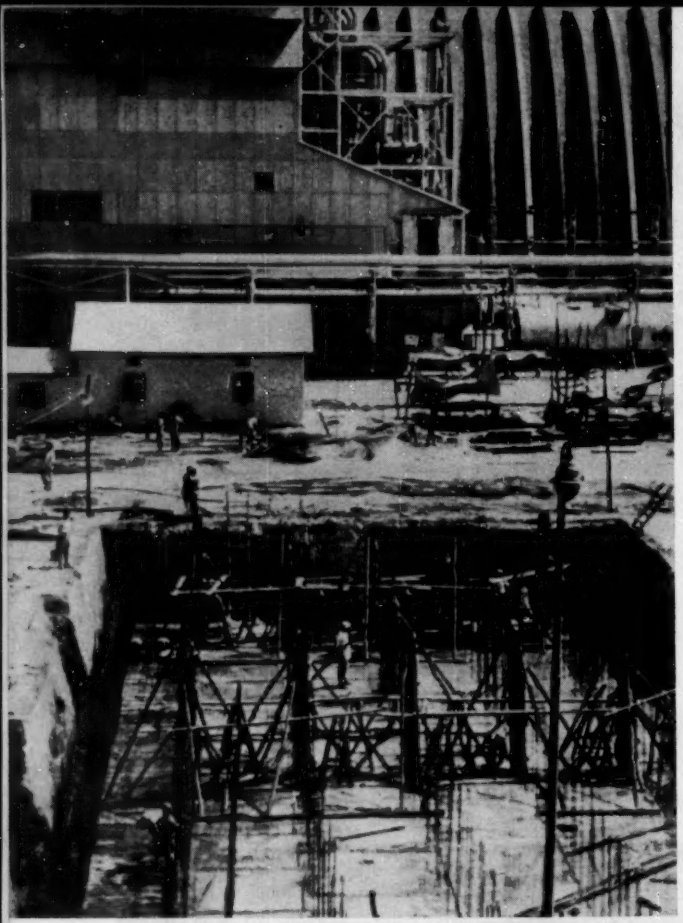
Added to these are ten $2,500 graduate study fellowships granted annually by Dow and administered by the Texas Division. These are awarded to the students of area colleges and universities, namely, U. of T., Rice, Tulane University, Louisiana State University, Oklahoma A&M, University of Oklahoma and Texas A&M.

Further student interest is engendered through the company's summer employment program, which provides both a source of income and experience in the chemical industry. Each summer, Dow hires a limited number of superior local students who are planning college science studies, places these youths in jobs that relate to their schooling, and gives them further experience through special training seminars in other phases of industrial operations including human relations, cost accounting and company organization.

Teacher Interest: To help inspire better teaching of science in high schools and colleges, Dow also employs science teachers on a temporary summer basis. Purpose here is to help teachers augment their incomes, gain practical insight into industrial applications of theoretical sciences. For high school teachers, the Texas Division has originated a program whereby the instructors can alternate summer employment at the plant with university enrollment in courses leading to a postgraduate degree in science, with company providing cash scholarships.

The company warns, however, that industry's job in this field is to tell, not sell, students and teachers. Overpersuasion, poor choice of job experience, and poor understanding of the potential scientist's outlook can seriously discourage both him and his teacher from active interest in the industry.

To Dow, the close liaison with colleges and secondary schools is a direct means of planting the seeds for its future requirements in scientific and engineering manpower. How the crop will flourish can't be estimated now, but Dow intends to keep expanding and refining its plan of inspiration, education and experience.



NEW PLANTS: Joint-venture chemical plants like this one at Sindri, India, are under construction in Canada and the Middle East, as . . .

THESE JOINT-VENTURE PLANTS HAVE BEEN PROPOSED

Type of Plant	Location	Companies Involved
'Aswan Dam' Plant (Nitric fertilizers) Scheduled for completion in '59.	Egypt	Societe Technique d' Entrepris Chimiques (French). Compagnie Industrielle de Tr vaux (French). Badische Anilin (German).
'Alberta' Plant (Fertilizers) Scheduled for completion in '56.	Alberta, Canada	Manufacture des Glaces Produits Chimiques de Sain Gobain, Chauny et Cir (French). Commercial Solvents Corp. (S.).
'French Africa' Plant (Aluminum)	Fr. Africa	Societe Europeenne d' Etud pour l'Industrie de l'Al minum en Afrique (Fren study group). Societe Civile d'Etudes Hydr electriques du Konkoure et Kouilou (French study grou
'Sindri' Plant (Urea and sulfur, nitrate of ammonia)	Sindri, India	Montecatini (Italy). Ansaldo (Italy).
'Cairo' Oil Refinery	Cairo, Egypt	Eni (Italian). Pibigas (Italian).

Foreign Companies Join Forces for Profit

Newest threat from abroad for U.S. chemical producers: joint international ventures on the part of foreign chemical companies.

European chemical concerns are finding that such projects pay off in more ways than one, and the number of these enterprises is on the rise. Following the example set by companies in Germany, France and Britain, an increasing number of companies in these and other countries are pooling their resources to establish chemical plants in third countries.

In general, foreign chemical industry people find that the joint venture is of particular value, and often necessary, when it enables several companies to raise the necessary funds for investments that would be too great for one company to handle alone. Such ventures are frequently organized to go into undeveloped areas where there are vast resources.

Joint-venture companies are finding, also, that a plant owned by companies representing several different countries frequently has a broader sales appeal in the over-all European market. Such a plant will dispose of its products in the immediate area, also find a ready market in the parent countries of its owners.

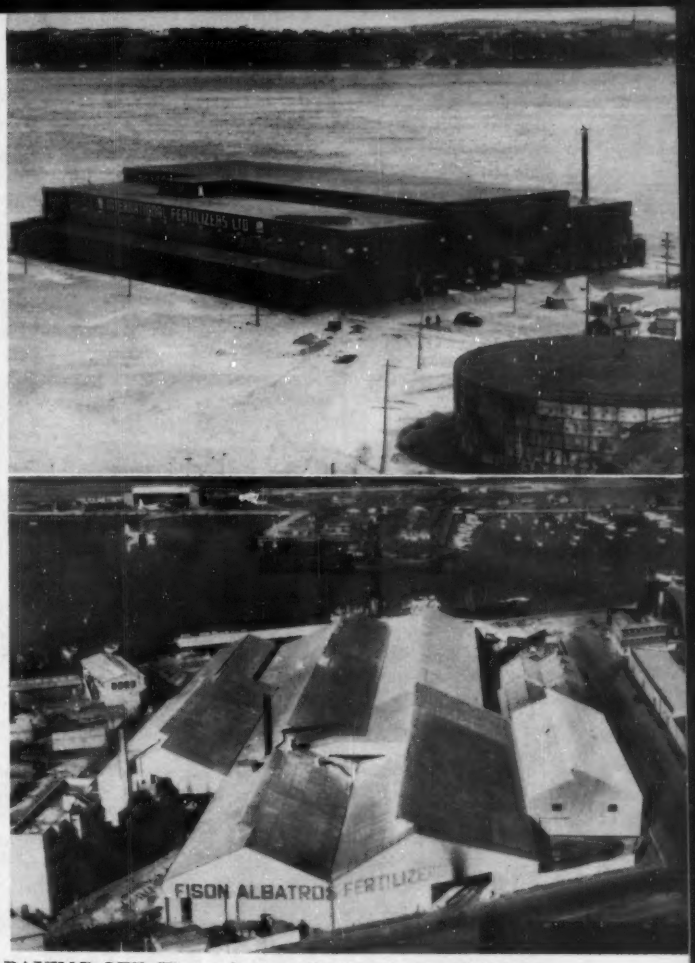
Joint-venture operations naturally make available more sources of capital to finance new chemical plants. This figured into the formation of Societe Norvegienne de l'Azote et de Forces Hydro-Electriques (*see table*), a Norwegian nitrate firm that is jointly owned by the Norwegian government and French private capital. It is quite possible, too, that such an international venture would be able to make out better on currency exchange than would a plant wholly owned by one country and operating in another.

Thus far, joint economic ventures have been received, for the most part, without very much cry of monopoly. It's difficult to criticize a plant owned by companies representing several countries. Likewise, the threat of nationalization is somewhat reduced, since there would be at least three countries involved—perhaps more.

There appears to be no general policy toward joint ventures on the part of the countries involved. France, for example, examines each case separately, and uses as its principal criterion whether or not the venture would be economically beneficial to France. Ventures that require large sums of money to leave the country are frowned upon, as are those ventures that would give France an unfavorable balance of foreign exchange. The fact that foreign companies are participating does not influence the decision. The French government looks favorably on joint ventures that

THESE JOINT-VENTURE PLANTS ARE IN OPERATION

Plant & Product	Location	Companies Involved and % Owned
Det Norske Nitridaktieselskap (Aluminum)	Eydehavn & Tyssedal, Norway	Compagnie des Produits Chimiques et Electro-Metallurgiques Pechiney (French)—⅓ interest. Aluminium Ltd. of Canada—⅓ interest. British Aluminium Co.—⅓ interest.
Aluminio Espanol (Aluminum)	Sabina Nigo, Spain	Compagnie des Produits Chimiques et Electro-Metallurgiques Pechiney—⅔ interest. Societe pour l'Industrie de l'Aluminum A. G. (Swiss)—⅓ interest.
Societe Norvegienne de l'Azote et de Forces Hydro-Electriques (Nitrates)	Norway	French private capital. Norwegian government.
Fisons Ltd. (Mixed fertilizers)	Durban and Kuilsrivier, South Africa	Albatros Superfosfaat Fabrieken (Dutch)—½ interest. Fisons Ltd. (British)—½ interest.
Fisons Ltd. (Mixed fertilizers)	Salisbury, Rhodesia	Albatros Superfosfaat Fabrieken —½ interest. Fisons Ltd.—½ interest.
International Fertilizers Ltd. (Mixed fertilizers)	Quebec and St. John, Canada	Albatros Superfosfaat Fabrieken —½ interest. Fisons Ltd.—½ interest.
Windmill Fertilizer Co. Ltd. (Mixed fertilizers)	New Ross, Erie	Albatros Superfosfaat Fabrieken —27% interest. Eerste Nederlandsche Cooperatieve Kunstmestfabriek (Dutch) J. J. Staffords & Sons Ltd. (Irish) William Dowler Ltd. (Irish)
South African Industrial Cellulose Corp. (SAICCOR) (Cellulose)	Umkomaas, South Africa	Snia Viscosa (Italian)—⅓ interest. Courtaulds (British)—⅓ interest. SAICCOR (Italian)—⅓ interest.



PAYING OFF: These plants at Quebec (top) and Durban, South Africa, like many joint-venture plants, are paying off.

implant a necessary industry in French territory, or that create an industry in a poor region and employ French workers.

While the Italian government looks with favor upon the many joint ventures in which its companies participate—two of the Italian groups thus involved are entirely state owned—the Italian Parliament has frequently criticized Italian companies for removing too much capital from the country. The Eni, an Italian group formed for the purpose of oil-exploration on Italian territory, has frequently come under parliamentary fire—especially from political parties favoring private enterprise—for sending abroad capital resources.

Germany, on the other hand, has taken advantage of joint-venture opportunities to gain commercial access to territories held by other countries—particularly France and Belgium. This has led to German-French and German-Belgian joint-venture plants in French and Belgian colonies in South Africa. The Germans feel that while the French and Belgian chemical industries are rather weak partners, they offer potentially profitable colonial markets.

While U.S. chemical companies have been slow to enter into joint ventures, there is evidence that this may change in the near future. Apparently, several U.S. companies have shown an interest in the proposed French Africa aluminum projects (*see table*).

Two French study groups are now investigating the economic possibilities of the projects from an industrial and administrative standpoint. These groups, with very low capitalization, are backed by a large and powerful international group, including Pechiney and the Society d'Electrochimie d'Ugine of France, Montecatini of Italy, Vereinigte Aluminum Werke of Germany, Societe pour l'Industrie de l'Aluminum of Switzerland, and Aluminium Ltd. of Canada. There is a possibility that companies from other aluminum-producing countries will be admitted to the circle later.

The projects began with the discovery, in 1942, by Pechiney and Ugine of extensive bauxite deposits close to the Konkoure River. Both the Konkoure and the Kouilou Rivers, sites of the proposed plants, have tremendous potentials as sources of hydroelectric power.

Final significance of these joint ventures (*outlined in the table above*) to the U.S. chemical industry remains to be seen. It's already evident, however, that such ventures are speeding up the industrialization of undeveloped areas. They are also beginning to compete with U.S. industry. Their growth might well whittle down potential foreign markets for U.S. chemical producers.

PHILADELPHIA'S CHEMICAL COMMOTIONS

WHAT HAPPENED	CONSEQUENCE	OUTCOME
Explosion and fire at Berg Laboratories in 1954.	City launched intensive inspection program, ordered 15 chemical firms to either correct defects or move.	Conditions were quickly corrected; orders to vacate were all withdrawn.
	Civil suits filed against two chemical companies by survivors of firemen who died fighting the blaze.	Out-of-court settlement is predicted.
Some production workers in epoxy tooling unit contracted dermatitis.	One-day sitdown strike by about 50 members of United Auto Workers.	Protective clothing has been issued to workers; company and doctors are working to prevent future occurrences.
Fire Dept. inspector found highly inflammable petroleum liquid in bottle labeled nonflammable carbon tetrachloride.	Fire marshal seized 3,600 16-oz. bottles, temporarily blocked sale of this product in Philadelphia.	Formulator has called in all mislabeled shipments; no injuries or damages; case marked "closed."

Chemical 'Scares': No More Headlines

Those "scare headlines" that have been ruffling Philadelphia's traditional calm are, for certain branches of the chemical industry, out of circulation. As of this week, it appears that most of the commotion that caused those headlines has subsided (*see table, above*). But the happenings make up an illuminating example of the public relations problems faced by this industry.

On the credit side, the chemical engineer hired by the city to make a plant-by-plant checkup on compliance with safety regulations in Philadelphia's 100-odd chemical process plants now gives a clean bill of health to all of those plants, including the 25 that originally were found to be violating the safety code (*CW, July 9, '55, p. 39*).

And the "Molotov cocktail" incident (last case in table)—played up in newspapers as a possible attempt at wholesale sabotage—turns out to have been the result of a slip-up in the formulator's bottling plant. No one was bent on "mass destruction"; there were no mishaps; and all mislabeled shipments have been recalled.

Workers Ask Remedy: Third recent Philadelphia incident reflecting on chemicals came at the plant where the Budd Co. turns out railroad cars and auto bodies. While the company holds that the immediate cause of a one-day "wildcat" sitdown strike last month in the epoxy resin tooling department was suspension of a shop steward for insubordination, United Auto Workers (AFL-CIO) says the work stoppage was in support of demands for steps to prevent dermatitis—blamed on a hardening additive in the resin. So far, the company has been providing special protective clothing; has its medical department working with an outside dermatologist to find ways of averting future skin-rash cases; has agreed to have the workers inspected daily and referred to the medical department when a rash is noted; and has promised to try to see that affected workers won't lose any income because of the dermatitis.

The man who inspected the factories—Boston-born engineering consultant Richard Vose, formerly with Du Pont—has helped to counteract the "scare" publicity that had aroused hostility toward local chemical producers. The entire industry, he says, has made the required improvements as quickly as possible, often at considerable expense.

Breathing easier now, Philadelphia's chemical management is starting a round of expansion projects*—not unmindful of the risk that another bad break in publicity might bring new regulations too stringent to live with.

LEGAL . . . . . .

Trade Secrets: Aula Chemicals, Inc. (Elizabeth, N. J.) has filed two suits against former employees within the past month in efforts to protect "confidential information." In New Jersey superior court, the company is seeking an injunction against Aaron Permut, a former employee now working as a consultant, to prevent the use of trade secrets he allegedly gained while working for Aula. At the same time, the firm is seeking $300,000 damages in New York federal court from Maurice Renner, also a former employee, charging that Renner and George Sherman, a former Aula distributor, have made "unlawful use or disclosure of" Aula's secrets. The latter suit seeks to prevent the defendants from using "confidential knowledge acquired" about processes for making textile pigments, from soliciting Aula's business, from representing similarities to Aula's product, and from competing within specified geographical limits.

•

Court Jurisdiction: The problems of getting a suit before the proper courts were illustrated last week in developments over a test of the 1921 Antidumping Act. In Washington, a special three-judge federal court took under advisement arguments over whether it has jurisdiction to hear a suit challenging the act's constitutionality. The suit was brought by two U.S. importers of British cast iron soil pipe, who were found by the U. S. Treasury and the U. S. Tariff Commission to have imported $200,000 worth of

*Chemical companies with expansion projects under way, or which have applied to Philadelphia's Dept. of Licenses & Inspections for building permits, include Hardesty Industries, Wilson Martin Co., Kessler Chemical Co., Allied Chemical & Dye, and Rohm & Haas.

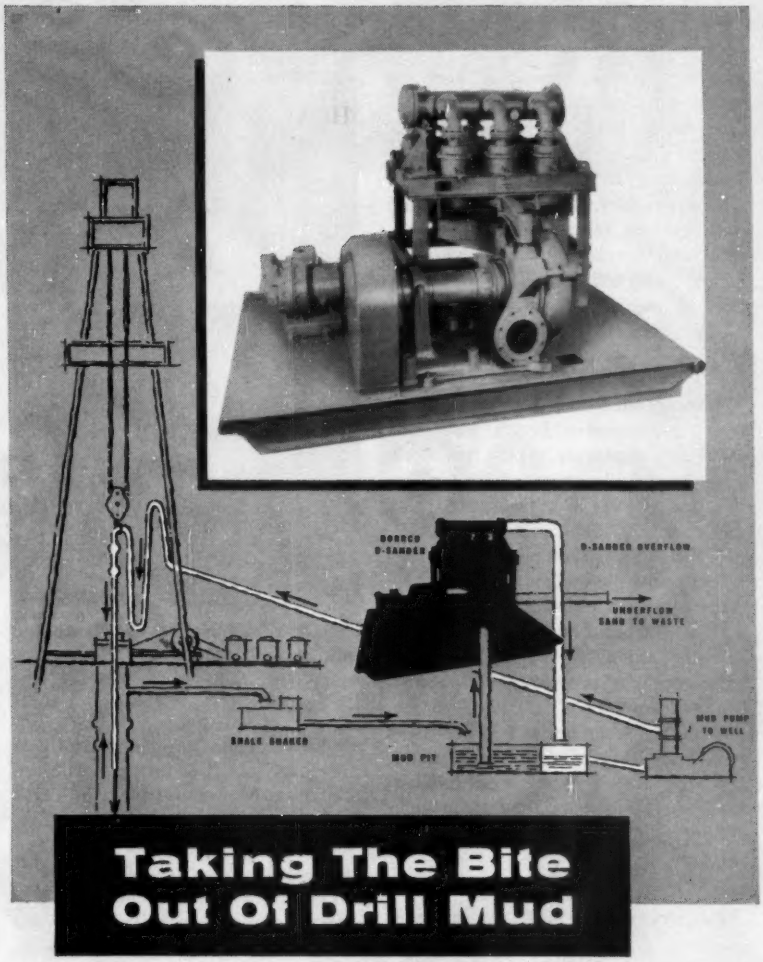
UNITED PRESS

U.S. ATTY. BECKER: Can customs court determine constitutionality?

British pipe and sold it here at prices "less than fair value," to the injury of the domestic industry. In appealing the decisions, the plaintiffs contend the appeal cannot be heard by the customs courts, that such courts must restrict their operations to "technical matters" of tariff law. A higher court, they insist, must determine the legality of the act. Assistant U. S. Atty. William Becker, representing Treasury and USTC—codefendants—argued there is no need for a special three-judge court to hear the issue, and that it should be heard either by a customs court or by a regular single-judge district court.

•

Conflicting Viewpoints: A case of widely divergent claims and counterclaims has finally been resolved—out of court—in the suit between Herbert Stecker (former head of Stecker Chemicals, Inc.) and Gallowhur Chemical Corp. (New York) (*CW, Sept. 18, '54, p. 28*). Stecker, who brought the suit, asserted he was induced to leave his own company by promises that he would be made Gallowhur's vice-president of sales, and by arguments that Gallowhur already knew how to make the slimicides that were Stecker's principal product. Stecker went on to state that Gallowhur did not actually have that knowledge; and that after he had joined Gallowhur, the company cut his salary and forced him to resign. Gallowhur, in its counterclaim, said it purchased Stecker's firm because the



Taking The Bite Out Of Drill Mud

Rotary drill muds are employed in oil drilling operations to remove cuttings and sand from the hole and to lubricate the drill bit in much the same manner that water cools a dentist's drill.

But don't let the word "mud" fool you. Drilling contractors will spend $20,000 or more per well on drill muds alone. Naturally rig operators want to recycle as much mud as possible. But the accumulation of sand and abrasives in rotary drill muds raises havoc with drill bits and pumps.

Late in 1954 the Dorrco D-Sander was developed to remove the harmful sand from drill muds by using a battery of DorrClone units. Typical savings for a 10,000 ft. well . . . a 79% reduction in repair parts costs . . . a minimum saving of 15 hours per well in rig time . . . 25% longer bit life . . . 19% more feet per bit. Or translated into dollars — an average saving of $3,500 per well.

Removing sand and abrasives from rotary drill muds may be only of academic interest to you. However if you have problems involving any phase of the separation of finely divided solids in suspension . . . or ion exchange . . . or fluidizing technique — chances are that Dorr-Oliver and its world-wide organization can help you.

D-Sander is a trademark of Dorr-Oliver Incorporated.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

company was infringing on a patent under which Gallowhur was exclusive licensee. It charged that while Stecker headed Gallowhur's sales, sales dipped more than 50%, forcing a cut in Stecker's salary. The case was settled with general releases on both sides, and with purchase by Gallowhur of some stock and other considerations held by Stecker.

LABOR . . . . . .

Broader Medical Coverage: A boost for comprehensive health insurance plans for employees comes this week from John Fuller, head of Shawinigan Water & Power Co. (Montreal) and its subsidiary, Shawinigan Chemicals Ltd. Shawinigan's comprehensive medical expense plan—first of its kind in Canada—was adopted last August, replacing a basic hospitalization plan. The new plan, Fuller says, "is the only one that provides built-in cost control from the bottom up." Coverage for employees and members of their families is 75% of necessary hospital expenses and—beyond a deductible sum that varies according to income—75% of the balance on other medical expenses.

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Country-wide Wage Rates: An issue confronting Administrator Newell Brown and the U.S. Dept. of Labor's Wage-Hour and Public Contracts Divisions is whether to establish a nationwide minimum wage rate for employees in industrial chemicals plants that hold U.S. government contracts. This contemplated action—demanded by the chemical labor unions under the Walsh-Healey law providing for determination of prevailing minimum wages for each industry in each locality—would eliminate the long-standing Southern wage differential. For the past few years, the Walsh-Healey minimum in the "industrial and refined basic chemical products" branch of this industry has been 95¢/hour in the South and $1.15/hour in all other regions. The unions want Brown to rule that in this case the "locality" should be the entire U.S. and the minimum should be $1.25/hour.

•

Gulf Coast Settlements: At chemical plants in the Gulf Coast area, recent wage settlements have been on the basis of the 6% increase pattern established earlier this year in the petroleum industry. New contracts calling for pay rises on that scale are in effect at Monsanto's plant in Texas City and at Ethyl's plant near Houston. The Ethyl agreement—ending a one-month strike by members of the AFL-CIO's Oil, Chemical & Atomic Workers—also includes a provision that the union will drop its "unfair labor practice charges" that had been filed with the National Labor Relations Board.

WIDE WORLD

USDL'S BROWN: For chemical wage rates, a U.S. minimum?

•

Start and Finish: Elsewhere, one long strike has ended with a wages-and-hours compromise, and another strike has started with disagreement over fringe benefits and grievance procedure:

- A more-than-six-months strike—longest in the history of Saskatchewan—is over with signing of a two-year contract between Mid-West Chemicals Ltd. (Palo) and the Sodium Sulphate Workers Union (CCL). There'll be a 5¢/hour wage rise for the remainder of this year and an additional 3¢ increase in 1957; and the work week will be trimmed first to 42 hours, then to 40.
- The nonaffiliated Niagara Plant Employees Union has pulled about 1,800 production workers off the job at the Du Pont plant in Niagara Falls, N.Y., in a dispute over new contract terms. Negotiators are at odds over grievance procedure, arbitration, surgical insurance and vacations.

KEY CHANGES. . .

Milton S. Samuels, to vice-president, Chemway Corp. (New Brunswick, N.J.).

Henry L. Pierson, to vice-president and secretary, Freeport Sulphur Co. (New York).

J. A. Holmes, to president, National Aluminate Corp. (Chicago).

Ferdinand K. Rodewald, to administrative vice-president, Metro Glass Co. (Jersey City).

M. G. Woodward, to director, Southern Nitrogen Co., Inc. (New York).

Mortimer B. Fuller, Jr., to vice-president and treasurer, International Salt Co., Inc. (Scranton, Pa.).

John G. Seiler, to president, Tube Turns Division, and **W. Roberts Wood,** to president, Girdler Co. Division, National Cylinder Gas Co. (Chicago).

Philip E. Sellers, to sales vice-president, Fischer & Porter Co. (Hatboro, Pa.).

Robert S. Ray and **Jack Tielrooy,** to vice-presidents; **Paul Foreman,** to secretary and treasurer; **W. W. Philips,** to comptroller, Brea Chemicals, Inc. (Los Angeles).

Carlton E. Goudge and **George E. Naylon, Jr.,** to vice-presidents, Gladding McBean & Co. (San Francisco).

Jackson R. Holden, to vice-president, Air Products, Inc. (Allentown, Pa.).

KUDOS. . . . . .

To **Edgar C. Britton,** director, Edgar C. Britton Research Laboratory of Dow Chemical Co. (Midland, Mich.), the 1956 Perkin Medal of the American Section of the Society of the Chemical Industry.

To **Albert E. Forster,** president and board chairman, Hercules Powder Co. (Wilmington, Del.), the 1956 Memorial Award of the Chemical Market Research Assn.

DIED . . . . . .

Meyer F. Simkin, 61, president, S.&H. Soap & Chemical Co. (Cincinnati, O), at Cincinnati.

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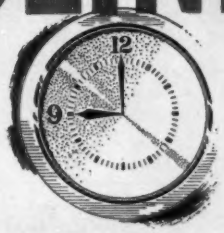

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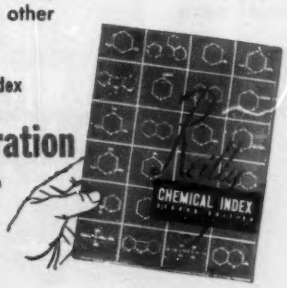

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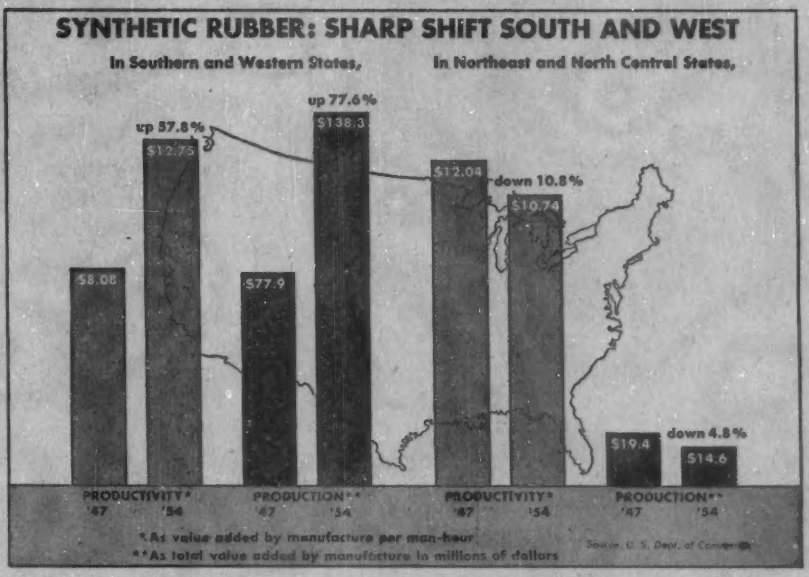
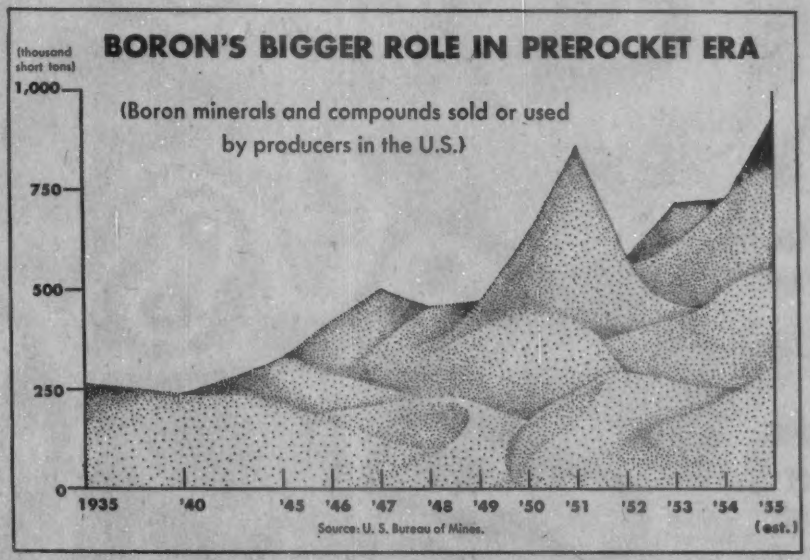
Charting Business

CHEMICAL WEEK
May 26, 1956



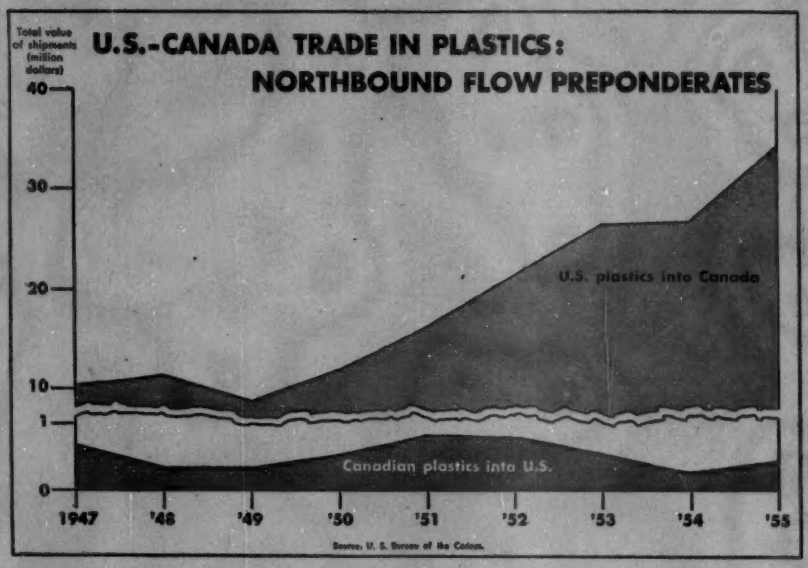
WITH THE LAST of the government's synthetic rubber plants (at Louisville, Ky.) now in private hands (Union Carbide and Carbon), the battle for increased production and productivity shifts to a new footing. Proof that optimum economic location pays off are the government's latest synthetic rubber industry figures. They reveal that plants in the South and West have far outstripped plants in other areas in increased production and productivity. Probable reason: better integration with petrochemical feedstocks.



WHILE BORON and its compounds continue to pour into widening, but traditional, markets (e.g., glass, porcelain, fertilizer and soap), new uses—many of them strategic—promise even greater boosts in consumption. Organic borates, for example, are now turning up in plastics, motor fuels, chemical intermediates and fungicides. Elemental boron (available in commercial quantities) is used as a neutron absorber for shielding reactors; diborane shows promise as a fuel in ram-jets and rockets because of its high energy content.

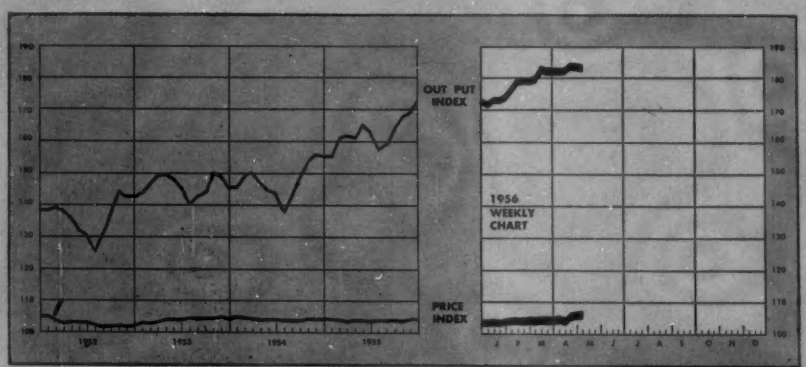
Charting Business

(Continued)



DESPITE the ebullience of Canada's chemical industry (some $100 million worth of expansion projects are now under way), synthetic resin and plastics production there lags far behind output of other chemical products. Recognizing the weak spot in Canada's industry, U.S. plastics makers are sustaining increased flow of plastics to the North. Canadian sources quickly admit, too, that the preponderance of imports will continue as long as competition in the U.S. plastics industry remains so stiff that it stifles Canadian expansion.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	181.9	183.2	165.1
Chemical Week Wholesale Price Index (1947=100)	105.8	105.9	104.3
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	476.3	490.3	407.1

MONTHLY Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	121.7	121.0	115.7
Chemical and Allied Products	106.9	106.5	107.1
Industrial Chemicals	120.7	120.0	118.0

CLEANSER-SANITIZER-DISINFECTANT FAMILY all stemming from...

Santophen 1: A Line Builder

All at once, specialty manufacturers seem to have awakened to the fact that Santophen* 1 (o-benzyl-p-chlorophenol) can be the base for an entire cleanser-sanitizer-disinfectant product line. The re-interest (since the product has been available for several years) is centered on three properties that set this germicide off from other runners-up in the specialty germicide field: the compound is comparatively free of odor, has low toxicity to humans, and is far less irritating to the skin than other disinfectant materials.

How these three unique properties ring a bell with specialty formulators is shown by the kinds of products in which Santophen 1 has made a big hit. Outstanding are the rug shampoos, where 3-4% of Santophen 1 in a coco oil or *anionic* detergent base gives rugs a sanitizing bath, leaving behind a fungicidal residue that protects the backing and nap against mildewing. This rug cleaner is particularly appreciated by hotels as insurance against "mustiness" in corridors and rooms. Formulated as a hospital disinfectant, the low odor makes the finished formulation pleasanter to have around day after day—particularly since the compound is effective against both gram-positive and gram-negative organisms and fungi.

Last and not least, the low order of toxicity and absence of skin irritability in practical concentrations have caught the eye of formulators of laundry rinses. A germ-discouraging final rinse can give commercial laundries something they can really advertise: ergo: "Not only spotless, but SANITIZED." This has a strong business pull for the laundry because the tiny amount of Santophen 1 that concentrates on the shirts, frocks, and diapers appears to have a tendency to minimize odor when the washables are worn.

The only drawback to formulators using it "across-the-board" is not a serious one, particularly in view of the compound's low cost. Santophen 1 must be formulated with a *saturated* fatty acid soap, such as coco oil or with a *non-ionic* synthetic. High-iodine-number fatty acid soaps (corn, tall oil, soya, rosin) and non-ionic and cationic detergents have a tendency to reduce the germicidal power on storage. But since so little does so much, most formulators are happy to take the few precautions necessary. In fact, changing the formulation of a pine-type sanitizer can actually reduce the final mixed goods cost. The high germi- and fungicidal power of Santophen 1 adds up to a good profit picture for the formulator. In concentrations as low as 75 ppm, it kills *trichophyton interdigitate*, principal cause of athlete's foot; 250 ppm control common mold (penicillium glaucum). This effectiveness in low concentrations has made it promising as a mold-control agent to keep water sweet and odor-free in closed circulating air conditioning systems. The negligible danger of toxicity to higher animals in handling makes it popular for poultry and livestock shelter germicides, rest-room sanitizers, and locker-room scrubbing compounds.

For the complete story on Santophen No. 1 and Santolite* MHP (described below) write today. Laboratory-size samples on request. Please, however, do not request special formulations or reveal your formulation to Monsanto... since this is your private, often most valuable property. Write to: Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Dept. CS-1, St. Louis 1, Missouri.

**Reg. U.S. Pat. Off.*

Lacquer Forecast: Bright and Clear

Despite a successful Hollywood screen test (Santolite MHP sheets made history as frangible clear "glass windows" that movie stunt men could dive through), too few know this phenomenal resin in the specialty lacquer field.

To specialty lacquers, Santolite MHP (a clear resin reaction product of toluene sulfonamide and formaldehyde) imparts extraordinary brilliance, adhesion and water resistance. It gives a high sheen with no further processing beyond stirring into solution. Because for all practical purposes the resin is non-toxic, it is used in nail lacquer and paper coatings.

Super-bright, super-clear straw hat lacquers are just one of a baker's dozen of specialty lacquers made with Santolite MHP... that package out as strictly "top-drawer" performers.

LACQUER GLEAMS (with Santolite MHP) on straw hats and fingernails.

For example, a straw hat lacquer using this formula:
1 part RS ½-Second Nitrocellulose
½ part Santolite MHP
½ part Santicizer* 160
Dissolve in 20 parts of solvent consisting of 10% ethanol, 40% butyl acetate, 50% toluene.

This lacquer can be formulated to high solids content because Santolite MHP is part of the formulation. Most important, the lacquer is completely colorless... and costs of making are low indeed.

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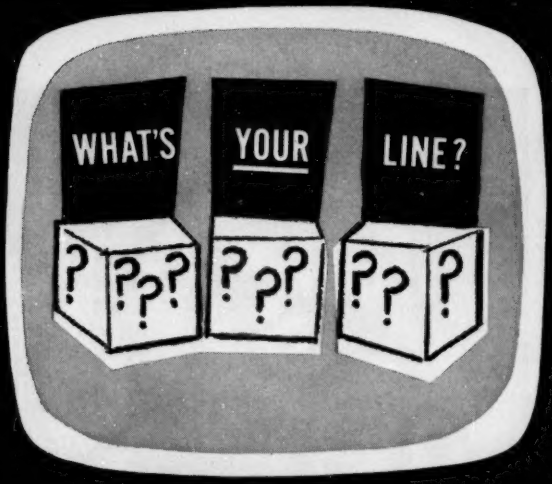

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Acknowledgment: "What's My Line" is a Goodson-Todman Production, seen weekly on CBS Television.

PRODUCTION

THE BEST WAY TO MAKE POTASSIUM BOROHYDRIDE IS TO . . .

1 First make sodium borohydride

- —Agitate sodium metal in oil under hydrogen to produce a dispersion of sodium hydride (NaH).
- —Add methyl borate to dispersed NaH to produce sodium borohydride, sodium methoxide.

2 Put it into saturated solution

- —Dissolve the mixture of sodium compounds in water.
- —Separate saturated solution from floating layer of oil dispersant.

3 Then treat it with potassium hydroxide

- —Add aqueous potassium hydroxide and agitate in sodium solution.
- —Separate precipitated potassium borohydride by centrifugation.
- —Wash, dry and package powdered KBH_4.

Extra Steps Cut Production Costs

At first glance, a reaction that goes directly from raw materials to finished product may appear to be the simplest route for a chemical process to follow. But a second look sometimes shows that it's cheaper, more efficient to take a circuitous method. Putting the latter theory to the test, Metal Hydrides, Inc. (Beverly, Mass.) recently went onstream with a roundabout process that cuts costs, boosts yields of potassium borohydride (CW, April 28, p. 66).

The most direct route to the alkali metal borohydrides is a straightforward reaction between the alkali metal hydride and an alkyl borate. This method works well for the production of sodium borohydride, but it's not economical for the preparation of potassium (and other expensive alkali metals) compounds. The reason: lower reactivity of potassium requires use of more excess hydride; some of the alkali metal winds up as the alkoxide (and by subsequent hydrolysis, as the hydroxide) instead of going completely to the borohydride.

To get around this cost problem, Metal Hydrides began investigating other means of making borohydrides. A research and development team headed by Robert Bragdon, M. D. Banus and E. R. Winiarczyk came up with a clever combination of reactions: first, a direct conversion of sodium metal into sodium borohydride; then, an efficient exchange by which potassium is substituted for sodium, precipitated as borohydride.

Cost and yield analyses over six months of pilot operation encouraged the company to convert its pilot plant to semicommercial production of several hundred pounds/day of potassium borohydride.

Dispersion Is Key: In the semicommercial plant, processing begins with the continuous dispersion and hydriding of solid sodium metal in an inert liquid hydrocarbon. Sodium and a refined, high-boiling mineral oil (e.g., Nujol, Esso's Primol D or Bayol 85) are agitated and heated to 200-350 C under an atmosphere of hydrogen. High-speed agitation by a turbine agitator breaks the molten sodium into tiny particles, produces finely dispersed sodium hydride in oil.

Oil-coated hydride is next transferred to a batch reaction vessel, where it is diluted with an additional amount of mineral oil. The dilute dispersion is then rapidly heated to 250-260 C while methyl borate is added at a steady rate. Materials are agitated and refluxed until the reaction is complete. Product is a mixture of sodium borohydride (yield: about 95.6%, based on methyl borate) and sodium methoxide ($NaOCH_3$).

When sodium borohydride is the desired end-product, it's extracted from the reaction mixture by a solvent (e.g., liquid ammonia, ethylene diamine), which is a nonsolvent for the alkoxide and mineral oil. The solvent is subsequently removed by evaporation to recover solid $NaBH_4$.

When potassium borohydride is required, the reaction mixture of sodium borohydride and methoxide in oil is dissolved in a solvent in which both of the sodium salts, but not the potassium derivative, are soluble. Water is commonly the solvent used, but it also contains methanol resulting from the decomposition of sodium methoxide.

The solution of sodium compounds separates from the mineral oil, is continuously withdrawn. Final step is the addition of 50% aqueous potassium hydroxide, which reacts with the sodium borohydride to precipitate KBH_4.

The product is then removed from the reaction liquor by continuous centrifugation, after which it's washed, dried and packaged as a highly pure, nonhygroscopic white powder.

Process Plus: From a production standpoint, Metal Hydrides' combination process is well qualified for commercial operation. Yields, according to examples cited in the company's patent (U.S. 2,720,444), range from 82.8 to 90.5%, based on contained

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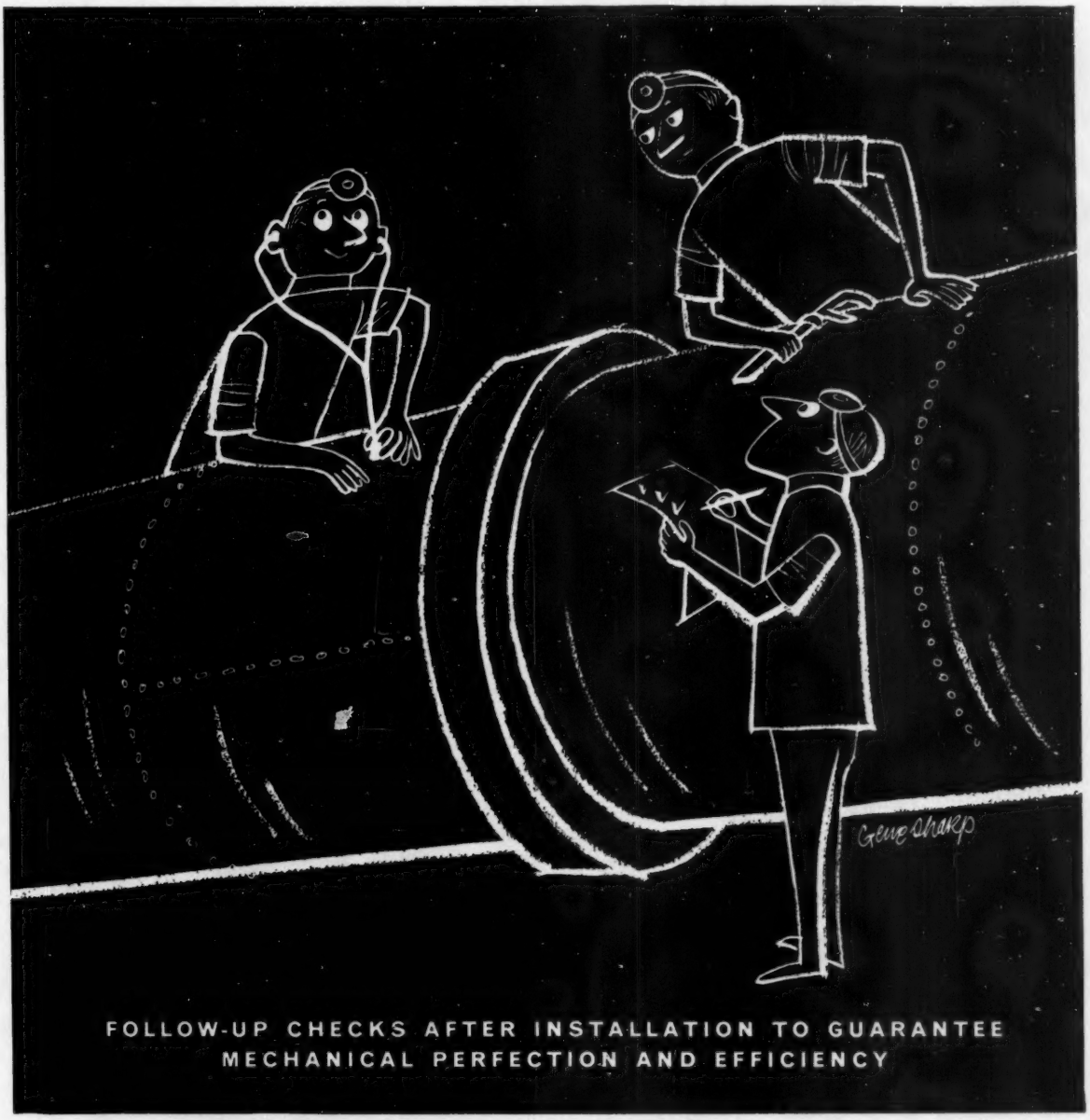

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KBH_4; purity runs from 98.4 to 99%.

Also, Metal Hydrides attributes several processing bonuses to the technique of operating with mineral oil dispersions:

- Rate of NaH formation is faster by hydriding in dispersion than by any other method.
- Oil-coated sodium hydride is much easier to handle than dry, powdered hydride of equivalent reactivity.
- Dispersions react with methyl borate 10 times faster than NaH made by any other known method.
- Reaction between hydride dispersion and methyl borate proceeds efficiently with stoichiometric quantities, doesn't require the use of excess hydride.
- The relatively large volume of oil absorbs heats of solution and reaction of $NaBH_4$, $NaOCH_3$ and any excess NaH, thereby preventing decomposition of sodium borohydride by overheating.

Growth Prospects: Though the borohydrides aren't, by commonly accepted standards, large-volume products (Metal Hydrides is the only commercial producer in this country), they're coming into greater use for tricky reductions (*see table*) used in the production of pharmaceuticals and fine chemicals. And despite its higher cost, the potassium compound offers several advantages that make it attractive to users.

For one thing, potassium borohydride is easier to handle—unlike the sodium compound, it's nonhygroscopic under normal plant conditions. Too, it has a negative heat of solution in water, obviates the need for cooling to prevent overheating of reaction products. And another factor is its ability† (in tetrahydrofuran solutions in the presence of lithium chloride) to reduce monoesters quite efficiently. A highly specific reducing agent, KBH_4 reacts selectively with functional groups, doesn't attack olefinic double bonds.

Another potential use for the borohydrides is in the preparation of diborane—a precursor of pentaborane rocket fuel. Though details of this classified application are obscured by security restrictions, rocket fuels would undoubtedly be a tremendous market (*CW Technology Newsletter, April 7*) for the product of an efficient borohydride-to-pentaborane process.

However the market shapes up, Metal Hydrides feels certain that it will be able to scale up its new process to meet any foreseeable demand for the borohydrides. The converted pilot plant is operating efficiently, design and engineering details have been worked out for large-scale commercial production.

But most important, the company has proved to its own satisfaction that, for potassium borohydride at least, the most economic short cut is the long way around.

†First reported by French researchers R. Paul and N. Joseph in 1952.

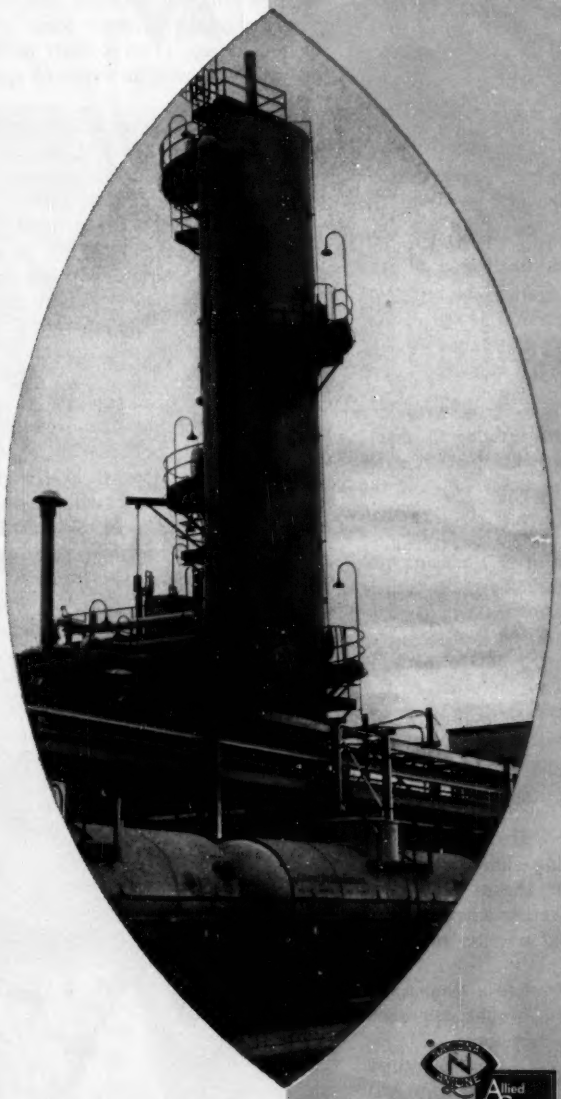
WHAT'S SPECIAL ABOUT BOROHYDRIDES

Because they are less reactive than powerful reducing agents, such as the aluminohydrides, borohydrides reduce organic compounds selectively, avoid undesirable side reactions.

They reduce . . .	Without affecting*:
acid chlorides	acetals
aldehydes	anhydrides and acids
hydroperoxides	amides and imides
ketones	double bonds
lactones	esters
quaternary ammonium salts	halides
sulfoxides	nitriles
	nitros (aromatic)

* Selective reductions of some components in this group can be achieved by the addition of certain metal halides to borohydrides in solutions of tetrahydrofuran or dimethyl ethers of diethylene and triethylene glycols.

OUTSTANDINGLY GOOD



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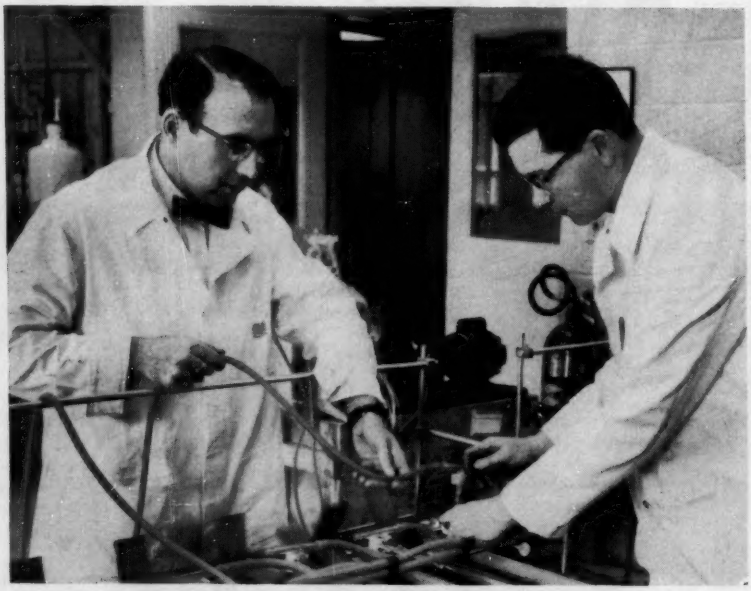


AMBERG, CORMACK: They're making things tough for fungi by . . .

Ganging Up on Slime

It may sound like a cure that's worse than the disease. But Crown Zellerbach may have to pay out several million dollars for a new plant simply to counteract a loss to commercial fishermen of not more than $100,000/year.

Commercial fishing along the Columbia River below Camas, Wash., isn't dying out, by a long shot. It just isn't as good as it used to be. The trouble is that Crown Zellerbach's mill there discharges a bacterial slime that promotes fungus growth. And the fungus, in turn, fouls up the fishermen's nets.

Time was when a fisherman could make three or four passes up or down the river without cleaning his nets. Now, he has to clean them after every trip. This means a collective fishing loss of no more than $100,000/year. Still, it's clearly the responsibility of industry to make sure that it doesn't cause an unnecessary economic burden to be placed on any other industry.

Three Routes Open: CZ is well aware of the fact that its effluent needs some cleaning up. It has, in fact, already spent $350,000 to construct a pipeline that carries its waste liquor into the river's deep-water channel. But that's only a partial solution, because, during the dry period (late summer and early fall), the river level drops and the stream flow is inadequate to dilute the waste.

To find the long-range solution, the firm has set up a special two-man team (*see cut*), which is looking at the problem intensely. Herman Amberg, leader of the team, is a former West Coast resident engineer for the National Council for Stream Improvement. His assistant, J. F. Cormack, is a biochemist recently returned to CZ from military service. The two are setting up controlled conditions on bench scale to pinpoint the growth of slime under different conditions of flow and temperature.

Right now, there are three possible ways of combating slime formation, none of which are cheap:

- It could convert to a kraft operation, which would cost as much as $7 million.
- It could convert to a magnesium process. The cost would approach that of a kraft conversion.
- It could set up a plant to utilize the waste liquor. The minimum cost for that would run approximately $3 million. Right now, Crown Zellerbach is experimenting with the liquor as a source of high-protein feed for cattle. Results so far have been encouraging.

Carrying Its Share: Whatever the decision, CZ is setting a fast pace for other process industry members in its approach to the trouble. It is recognizing a problem and taking active steps to correct it, even when it is not entirely responsible. For although wood sugars from the mill are thought to be a major factor in the fungus growth, the discharge from the city of Portland contributes, too.

Also, Columbia River dams, particularly McNary, have increased the formation by stabilizing the flow of water. Formerly, the rapid movement would tear the growths loose from their moorings. (This is likely to happen this year with an expected spring flood.)

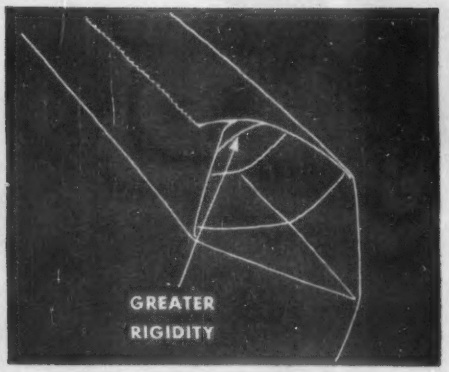
In the past, Crown Zellerbach has not blanched at spending money to alleviate pollution. For instance, it spent $500,000 in 1952 to convert its Lebanon, Ore., mill to an ammonia-base process. This enabled it to evaporate and burn the waste. At West Linn, Ore., it spent $150,000 to install ponding facilities so it could impound waste liquors and control their discharge to the stream.

All told, the firm has spent $1.25 million in plant installations and research studies on pollution since '40.

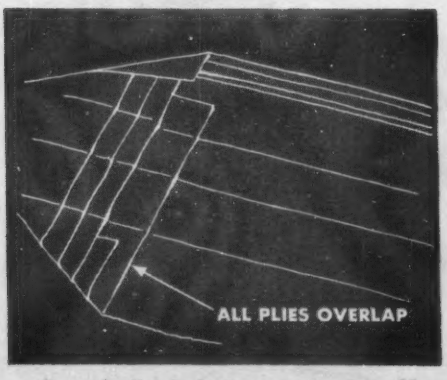
Any money Crown Zellerbach spends on slime control facilities would be more than a means of restimulating the fishermen's business. It would help in countering other aspects of pollution. And chances are it would find economic justification through a more efficient operation. Not to be overlooked, however, is the over-all, long-range investment in goodwill.

FOULED NETS: More time for cleaning, less for fishing.

NEW! UNION BAG GIVES YOU AN IMPROVED PACKAGE WITH THE MOST SIFT-PROOF PASTED VALVE MULTIWALL



More functional valve corner for high-speed packers. Built-in reinforcement. Easy to handle. No insert needed.



Stepped plies in bottom construction add strength, end sifting. In the new Union Stepped End Multiwall, *all* plies overlap.

Reinforced stepped end bag adds strength, simplifies handling

Now—finally and completely—you can put an end to the waste, disorder, and customer dissatisfaction caused by excessive sifting and spillage. Union Bag's new sift-proof Stepped End Multiwall gives you better performance, greater strength, and definite packaging-line savings. You get more accurate weights; cleaner plants, cars and warehousing.

EASY PLACING ON VALVE PACKER. This new Union Multiwall saves labor, maintains packers' rhythm and speed. Built-in stiffness at the valve corner speeds the feeding operation.

NO INSERT. The Union Stepped End Multiwall does not require an insert. The valve corner itself has been designed to serve as a natural insert. No catching on the valve spout.

STRONGER BOTTOM CONSTRUCTION. Stepped (or overlapped) bottom and valve construction permits every ply to overlap. The points of greatest pressure receive maximum reinforcement.

IMPROVED VALVE. The top of the valve also has been reinforced to prevent blow out and insure against breakage on the valve spout.

ASK FOR DEMONSTRATION. A Union representative will be glad to show you samples of the new Stepped End Multiwall, along with performance records.

NOW! A TRULY SIFT-PROOF MULTIWALL!

Yes, we would like to hear more. Show us how your new Stepped End Multiwall can make our packaging operation more efficient.

NAME ..... TITLE .....

COMPANY .....

STREET .....

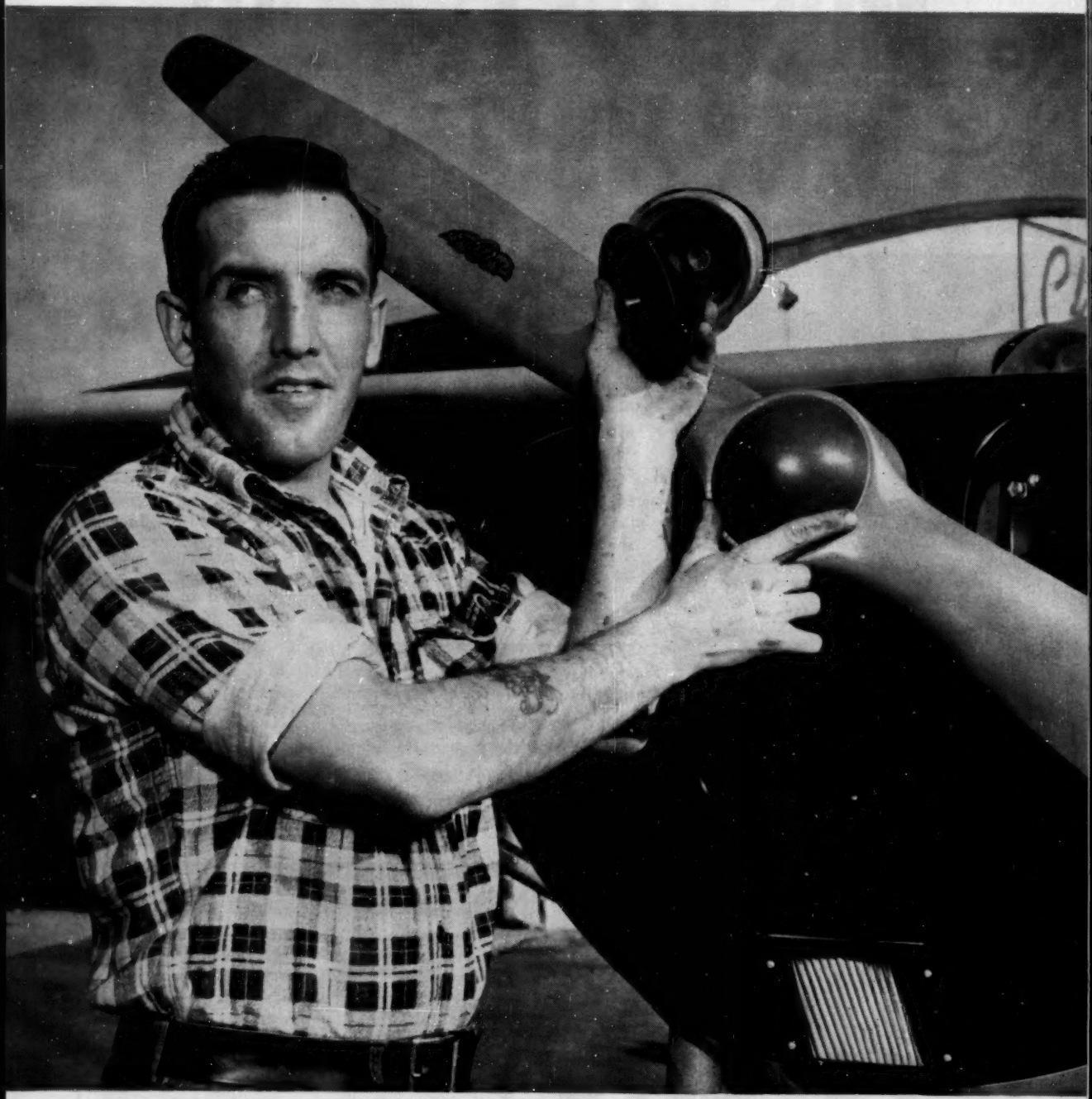
CITY ..... ZONE .... STATE .....

Mail to: Union Bag & Paper Corporation, Multiwall Division, 233 Broadway, New York 7, N. Y.

UNION
Multiwall Bags

Another Opportunity Chemical from General Mills

Tough, low-cost plastic easy to make with



Plastic lathe fixture, left, is used to make propeller spinners at Champion Aircraft Corp.

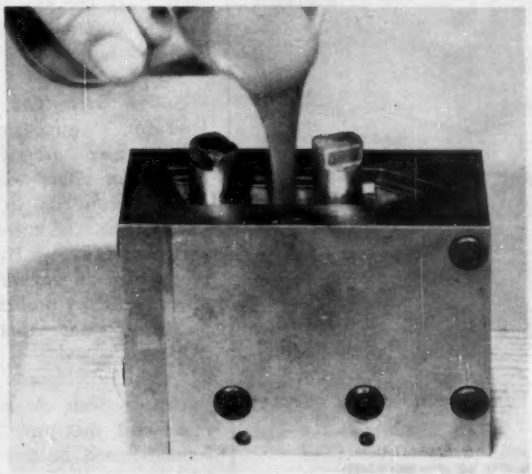
**Investigate Versamids the versatile polyamide resins made only by...*

CHEMICAL DIVISION

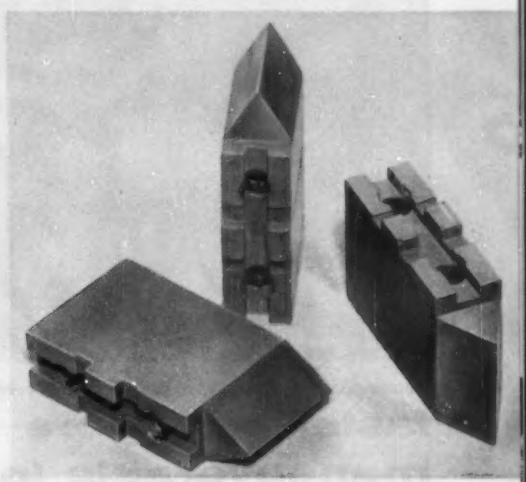
tools and dies are Versamid*-epoxy alloys!

Strong, lightweight plastic tools have passed rigid, practical tests and are in daily use in aircraft, automotive and other industries. Champion Aircraft Company of Osceola, Wis. is one of many manufacturers who have found Versamid-epoxy alloy tooling economical, efficient, and a valuable aid to their business. Thermosetting alloys of Versamid-epoxy resins are being used to produce aluminum and even heavy gauge steel stampings. These alloys show high impact strength, are extremely easy to work with, and can be formulated to yield almost any set of properties desired. It's easy to make durable Versamid-epoxy tools, as shown below.

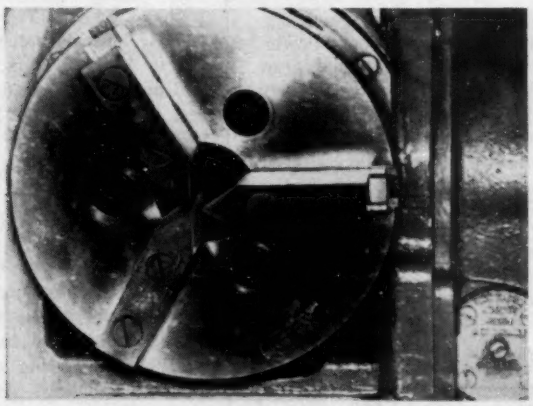
Maybe tools and dies aren't your problem, but chances are you can use Versamid polyamide resins to save time and money in other applications. Tough industrial finishes, plastic body solder, structural adhesives, rugged plastic laminates . . . these are but a few of the known and tested uses for versatile Versamids. Only Versamid polyamide resins do so many jobs so well, and only General Mills makes Versamids.



1. Here an alloy of Versamid 125, epoxy resin, and aluminum powder is poured into a brass mold.



2. These soft jaws, or chucks, are molded from Versamid-epoxy alloy at extremely low cost.



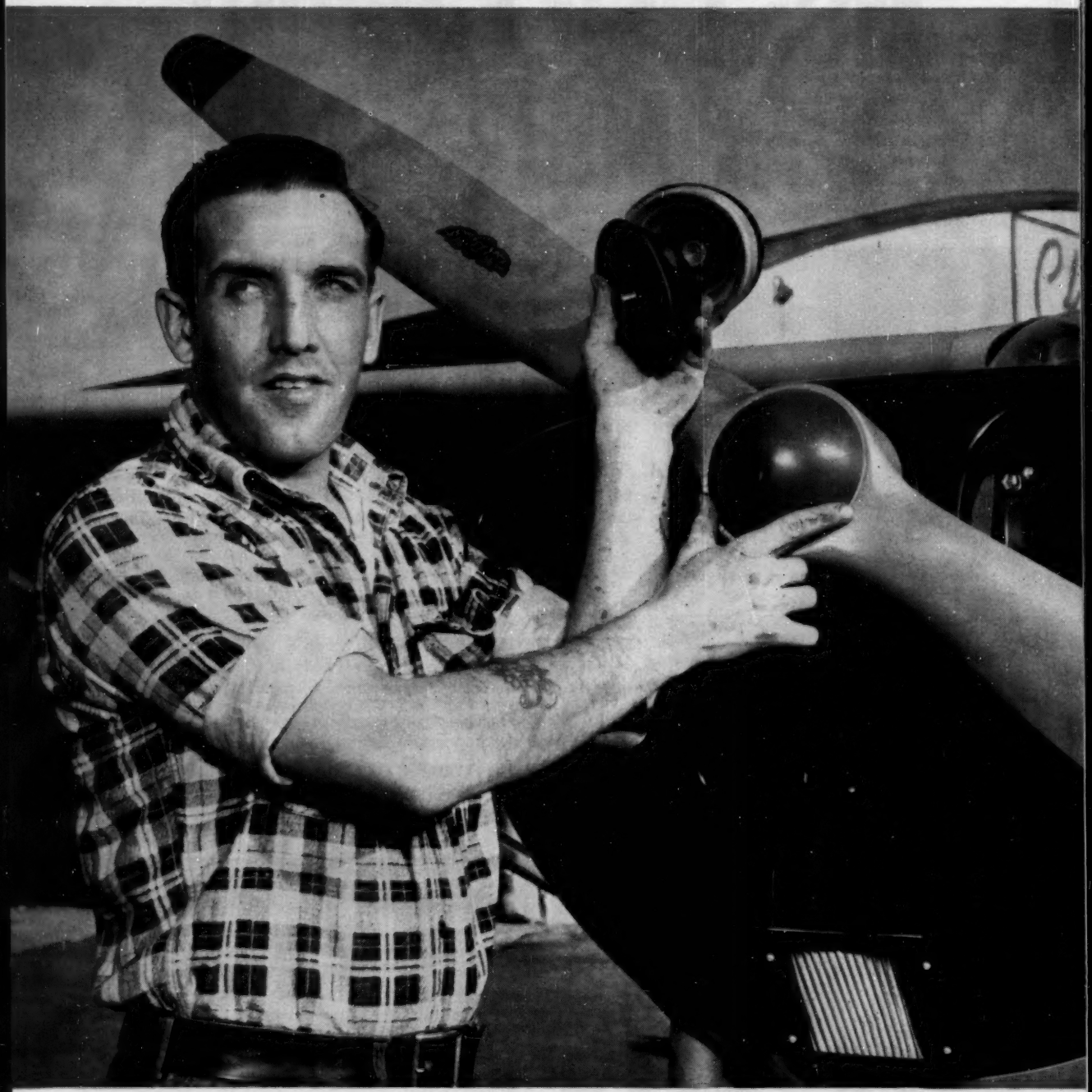
3. Finished three-jaw chuck is in regular use on a lathe at General Mills Mechanical Division.

For more detailed information, write for the Spring issue of *Progress Thru Research.* It carries a fact-filled article on plastic tooling. If possible, name your needs for specific advice on the application you're considering. Please note that General Mills does not market plastic tool and die alloys . . . only the Versamid polyamide resins used in such alloys.

OF General Mills KANKAKEE, ILLINOIS

Another Opportunity Chemical from General Mills

Tough, low-cost plastic easy to make with



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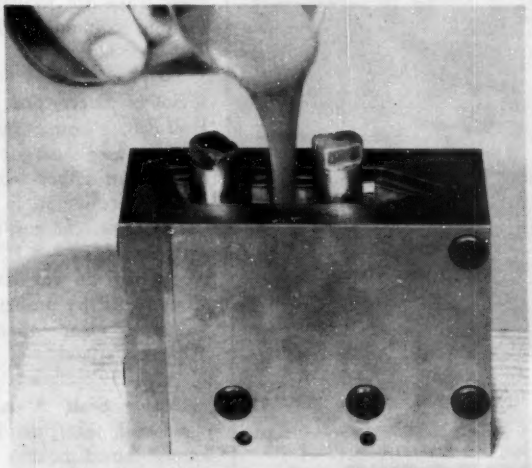

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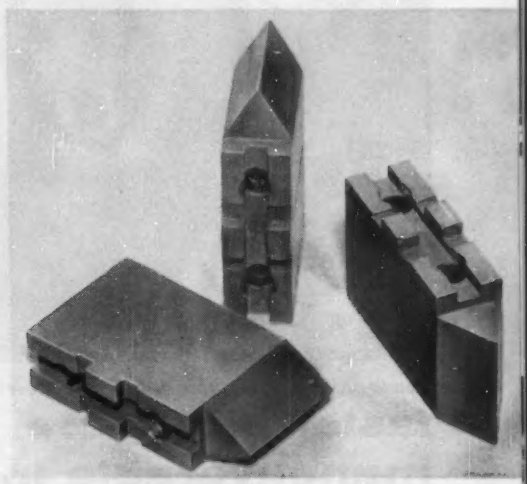

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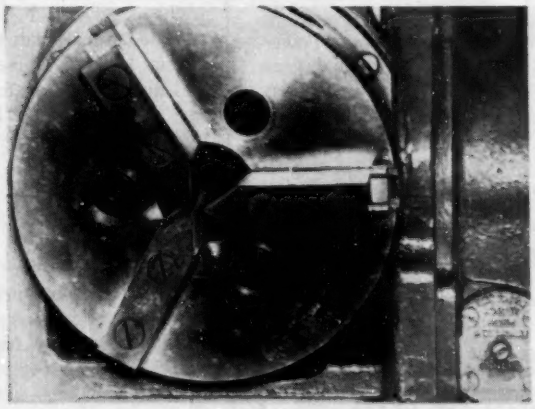

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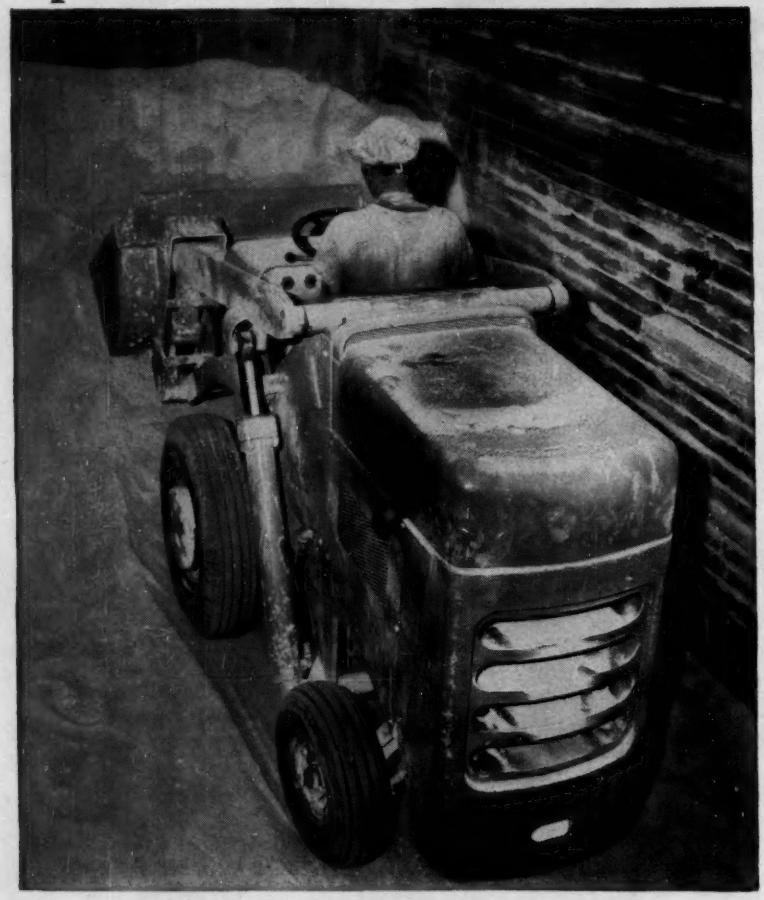
OF General Mills KANKAKEE, ILLINOIS

Report on the new MICHIGAN 12B



Power-shifting makes this new tractor shovel

faster and more maneuverable in boxcars and narrow aisles

If you've ever tried to shift gears and turn a corner at the same time, you'll understand why the new Michigan 12B is faster and more maneuverable in tight quarters. *You don't even have to stop to shift the 12B.* Without taking your left hand from the wheel, you simply push the single power-shift lever to High, Low or Reverse—instant shifting, just like a new car.

Speeds cycles. Clark's exclusive power-shift transmission and torque converter completely eliminate the clutch pedal and engine clutch; no gear clash, no hesitation. Power-shifting instead of a manual gear-shift saves valuable seconds on every cycle, in addition to eliminating down-time due to clutch trouble.

Dust protection. Oil bath air cleaner, filters and sealed assemblies protect the 12B against dust and dirt in every conceivable way. Take a first-hand look at this modern Tractor Shovel—clip the coupon to your letterhead and we'll arrange a demonstration in your own plant.

Available on Clark's no-down-payment Lease Plan; write for Data Sheet 111.

Michigan is a reg. trade-mark of

CLARK EQUIPMENT

Send details on the Michigan Model 12B

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2459 Pipestone Road
Benton Harbor 3, Michigan

PRODUCTION EQUIPMENT

Glass Tray: A new Turbogrid tray has been designed by Pfaudler Co. (Rochester, N.Y.) to permit all-glass construction in glass-lined, tray-type columns. The problem of supporting a glass tray has been solved by utilizing glassed Inconel cups, which bolt to sidewalls of the column. They hold four extra-heavy Pyrex supports (sheather with Teflon or polyethylene to prevent wear of glass against glass). Grid is formed by small Pyrex tubes laid across the supporting members. Greater capacity of Turbogrid trays, says Pfaudler, reduces initial cost of columns, provides better performance than does bubble-cap or packed-column construction—particularly where ratio of liquid to vapor feed is low. The glass trays are available for new or existing columns with diameters of 18 in. or larger.

•

Solids Sizer: The Allen-Sherman-Hoff Co. (Wynnewood, Pa.) is out with a new sump-type, double-roll grinder for either wet or dry sizing of solids conveyed in material handling systems. The new double-roll construction, says A-S-H, handles larger pieces than do single-roll grinders, reduces wear by utilizing tremendous pressures, rather than attrition, for sizing materials.

•

Heater Seal: A new ceramic-to-metal seal, that provides tubular and tubular-finned heaters with hermetic protection against moisture and fumes, has been developed by General Electric's Industrial Heating Department (Schenectady, N.Y.). Recommended for use at temperatures to 750 F in air, to 1,000 F in inert atmospheres, and liquid pressures to 4,000 psi., the seal is said to be highly resistant to thermal shock.

•

Tough Elastomer: For hydraulic systems and other applications where sealing and abrasion are problems, Greer Industries, Inc. (Jamaica, N.Y.) recommends components made of Disogrin—a new di-isocyanate elastomer. Available in two basic types (for either liquid casting or compression-injection molding), Disogrin is said to provide good resistance against high ozone concentrations, oils, jet fuels and radioactivity.

•

Sprayable Plastisol: Pore-free plastic

tecquinol

Eastman technical hydroquinone

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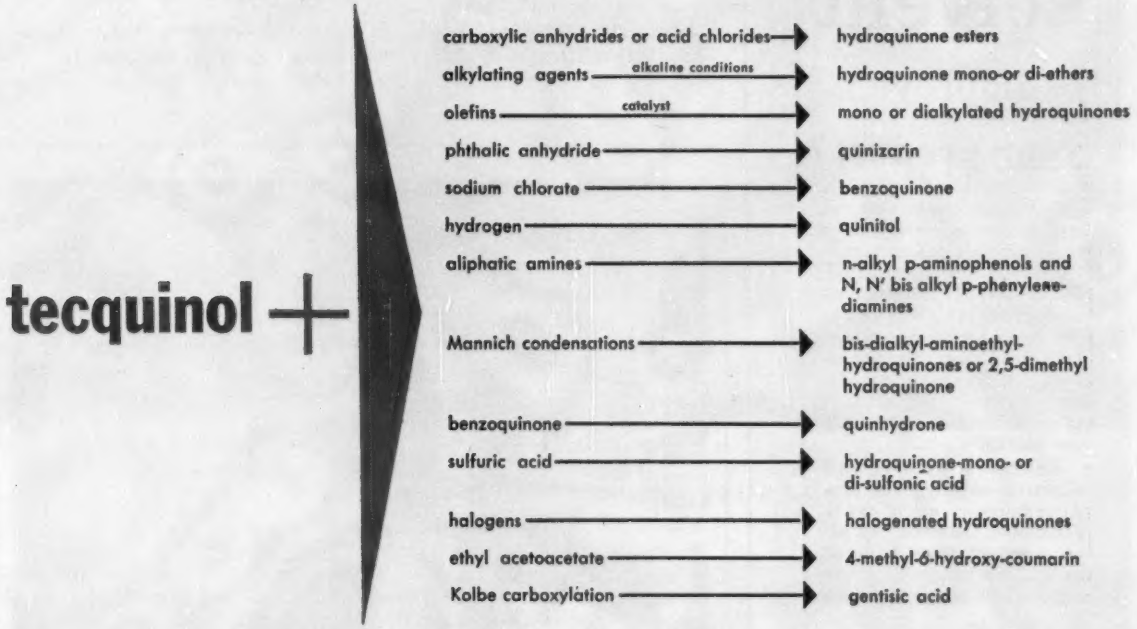
tecquinol +
carboxylic anhydrides or acid chlorides → hydroquinone esters
alkylating agents —alkaline conditions→ hydroquinone mono-or di-ethers
olefins —catalyst→ mono or dialkylated hydroquinones
phthalic anhydride → quinizarin
sodium chlorate → benzoquinone
hydrogen → quinitol
aliphatic amines → n-alkyl p-aminophenols and N, N' bis alkyl p-phenylene-diamines
Mannich condensations → bis-dialkyl-aminoethyl-hydroquinones or 2,5-dimethyl hydroquinone
benzoquinone → quinhydrone
sulfuric acid → hydroquinone-mono- or di-sulfonic acid
halogens → halogenated hydroquinones
ethyl acetoacetate → 4-methyl-6-hydroxy-coumarin
Kolbe carboxylation → gentisic acid

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coatings can be spray-applied in a single application, says Metal & Thermit Corp. (New York), with its new Unichrome Super 5300 vinyl plastisol formulation. Sprayed coatings cure to a tough, flexible film that resists chipping, abrasion and the corrosive action of strong acids, concentrated caustic, salts and other chemicals.

•

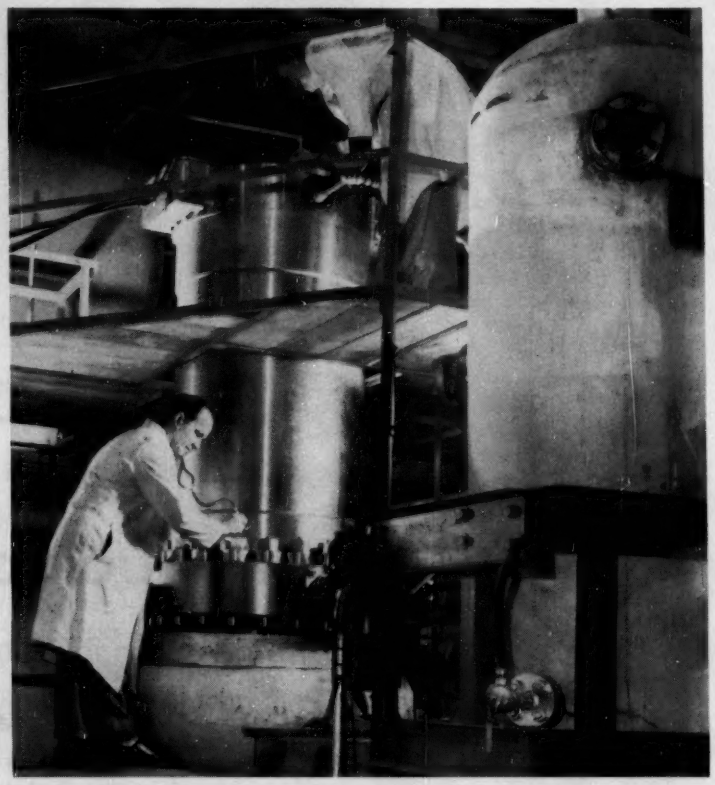
Onstream Analyzer: A new instrument for process stream control (*CW, May 19, p. 138*) is Manufacturers Engineering & Equipment Corp.'s (Hatboro, Pa.) Meeco-Matic Model II recording differential refractometer. Based on a Du Pont design, it's useful for analyzing binary-liquid streams, is said to be 10 times more sensitive than present laboratory-type instruments.

•

Gearmotors: Reliance Electric & Engineering Co. (Cleveland, O.) has unveiled a series of gearmotors in ac. and dc. models, rated from 1 to 60 hp. Two-way seals are said to lock oil in, keep dirt out, and facilitate mounting in any position without oil leakage. A wide range of mountings, enclosures and gear ratios is offered.

•

In-Line Solenoid Valve: Airmatic Valve, Inc.'s (Cleveland, O.) "In-Line" 2-way direct solenoid-controlled



Mechanical Heart Gets a Checkup

EVEN A HUMAN HEART has seldom been checked more thoroughly than this 1,600-hp. canned-motor pump—largest one ever built—being tested by Westinghouse technicians. Heart of the now-under-construction Shippingport atomic power plant, it's one of three main coolant pumps, each of which will circulate more than 18,000 gpm. of radioactive water at 2,000 psi., 500 F.

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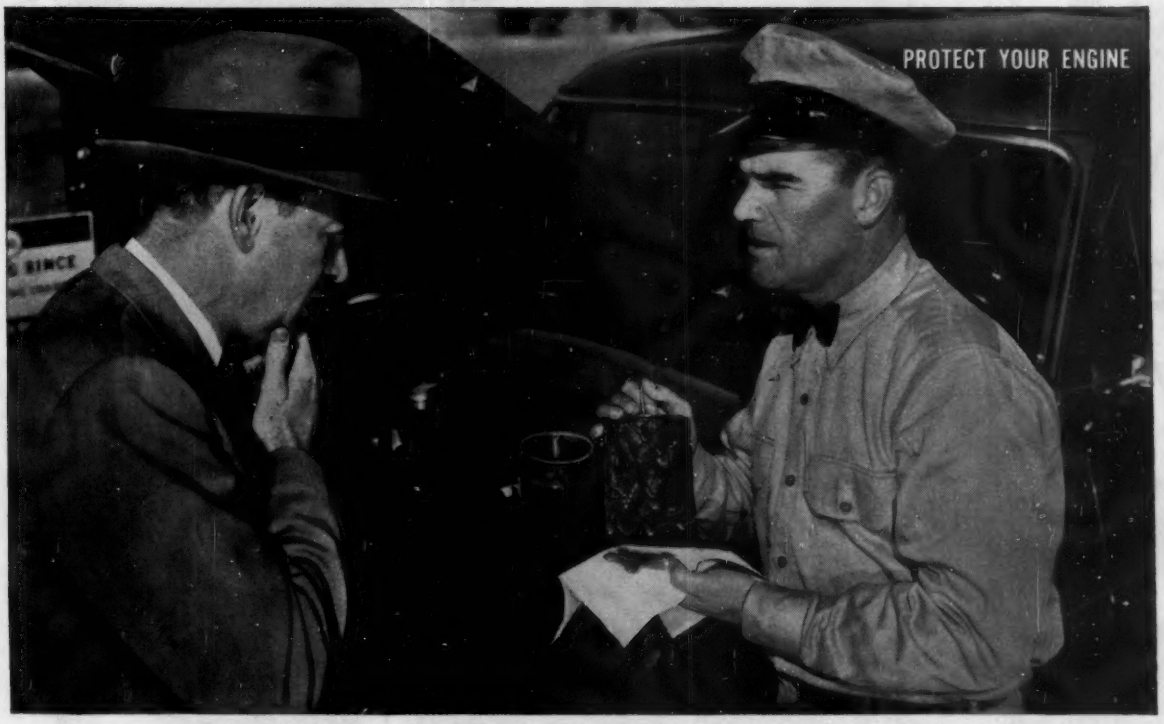

FOR MORE THAN 5,000 MILES, this oil filter has protected an engine by keeping dust, hard carbon and sludge from engine parts. Using porous paper made by paper mills from Hercules® chemical cotton as a filtering material, this equipment is one of the most important items in helping you to get the most in trouble-free miles from your car. (Photo courtesy PurOlator Products Inc.)

QUICKLY INSTALLED sheets of gypsum board are helping to produce new homes faster and more economically. To provide the surface of these sheets with the required water resistance, many manufacturers rely on Hercules Pexol® 240—one member of the large family of Hercules sizes for the paper industry.

HIGH GRADE COTTON is the product of healthy cotton plants. Insecticides based on Hercules® toxaphene help produce premium fiber by keeping the plants sturdy and free from insect pests that discolor the lint and increase trash content. Toxaphene means higher quality cotton at lower insecticide cost.

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GENERAL PURPOSE

PLASTIC PIPE

ACE-ITE is a new moderately priced rigid plastic pipe with exceptional impact strength and toughness . . . handles most corrosive fluids in your plant at moderate temperatures and pressures.

For piping most inorganic acids, salts, alkalis and many organic chemicals, it's the equal of plastics that cost far more. ACE-ITE maintains good strength, rigidity and chemical resistance from minus 40 deg. F. to 170 deg. F. Light in weight, it is odorless, tasteless, non-contaminating. Saves cost of painting, immune to electrolytic corrosion and bacteria. Available in pipe sizes from ½" to 6", standard and extra-heavy, with wide variety of fittings.

ACE-ITE is only one of eight types of rubber and plastic pipe now offered by American Hard Rubber Company. Write today for free technical Bulletin 80.

ACE rubber and plastic products

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93 WORTH STREET • NEW YORK 13, N. Y.

PRODUCTION

valve boasts easy inspection and service because all control parts are removed in one assembly by loosening one nut. Piping remains intact. Designed for pressure and vacuum applications, it is actuated by relay or micro-switch, comes in ¼- to 2-in. standard pipe sizes.

•

Flow Indicator: A new flow indicator for purge-service or flow-rate indication of hazardous fluids is available from Brooks Rotameter Co. (Lansdale, Pa.). Designated as Model 3602 Armored Flow Indicator, it has no glass parts in contact with metered fluid, measures standard flow rates from 1.5 to 180 gph. of water. The unit operates at pressures up to 1500 psig. and temperatures to 400 F.

•

Non-Skid Tread Plate: New aluminum tread plates that provide sure footing even when covered with oil, grease or water, are now offered by Alcoa (Pittsburgh, Pa.). Plates are rolled with a fused aluminum abrasive oxide on one surface, may be shop-fabricated by shearing, sawing, punching and drilling; abrasive layer reportedly doesn't separate from plate even in welding.

•

Burner Throat Tile: Peabody Engineering Corp. (New York, N.Y.) has come up with a new design of rifled burner-throat tile that's said to give flame stability over a wide range of gas firing conditions. Gas flow can be reduced to minimum setting, windbox pressure to maximum, without loss of ignition.

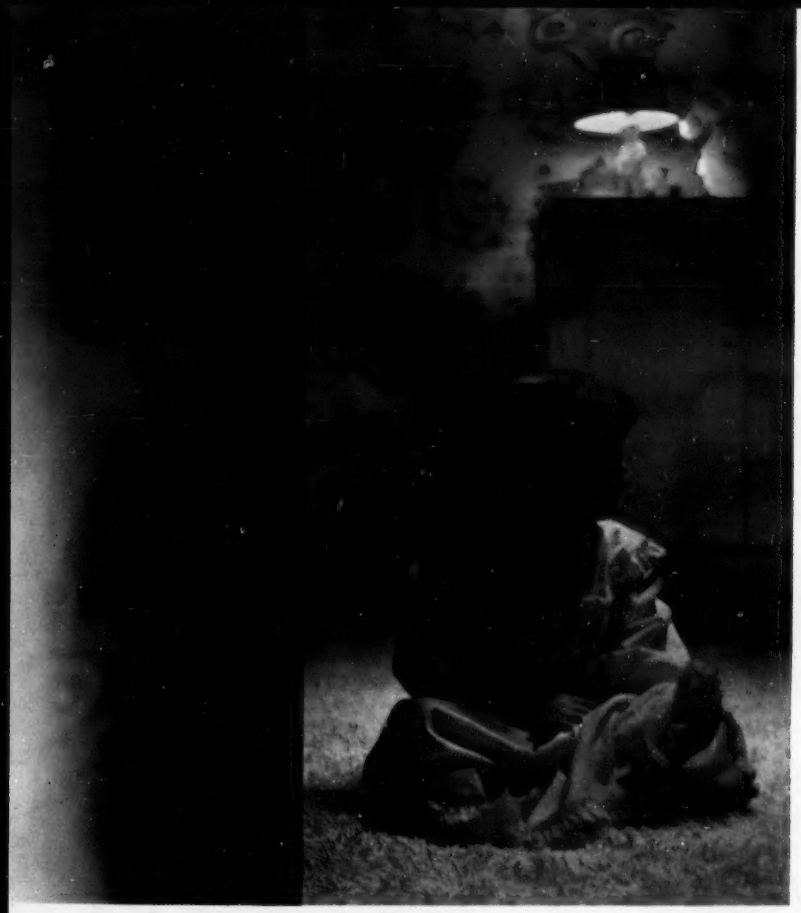
•

Spray Nozzle: A new WhirlJet spray nozzle, offered by Spraying Systems Co. (Bellwood, Ill.), leaves very little area for condensation of floating water particles because it's designed to be mostly enclosed by the wall or manifold in which it is installed. Two types, both without internal cores and giving hollow cone sprays, are available: BD 10 has ⅜-in., BD 50-50.3 has ¾-in. male pipe connections.

•

Reducing Valve: A simple air loader replaces the conventional loading spring on the diaphragm-operated, pressure-reducing Class GPK valve now available from Leslie Co. (Lyndhurst, N.J.). The new device produces a constant loading force on the diaphragm, gives the same control point over full valve travel.

it pays to see VICTOR



Fire Protection for Precious Property

Best way to prevent fire (and perhaps save a life) is to *flameproof*. Victor ammonium phosphate is just such a flameproofer—low in cost, yet remarkably effective in rendering flameproof such fire feeders as many insulation materials, wood, paper products, draperies, house paints—even little girls' clothing.

If you make a product that's flammable, investigate Victor flame-proofing chemicals that make your product safe, and add an important new sales feature.

Use the coupon for further information about Victor flame-proofing chemicals.

SODIUM PHOSPHATES . . .
Versatile Performers for Industry

As most any manufacturer of detergents and soaps can tell you, Victor sodium phosphates make all the difference in the world in the effectiveness of these products. That is why these versatile performers are standard in so many detergent and soap formulas. A long list of other products—cement, paper, industrial cleaners, oil drilling mud, to name a few—benefit through the use of hard-working sodium phosphates.

Check the free Victafiles listed on the next page for the one that tells about the Victor Chemicals being profitably used in your industry.

Dyed in the Wool

With the help of Victor diammonium phosphate (and somewhat more practical equipment), this amateur might easily qualify as a professional dyemaster. That's because, in dyeing natural fibers and synthetic worsted blends, diammonium phosphate is so dependable that even a child could be entrusted with its use. This remarkable chemical maintains rigid *automatic* control of the dye bath.

Victor diammonium phosphate assures maximum penetration, uniformity, levelness, a gradual increase in acidity that assures proper fixation and exhaust—meets every high performance requirement of delicate or specialized dyeing jobs at low, low cost.

And for many standard dyeing jobs, Victor formic acid is the favorite among leading textile processors. It *pays* to see Victor.

Former major leaguer Tony Piet works out with Little Leaguers

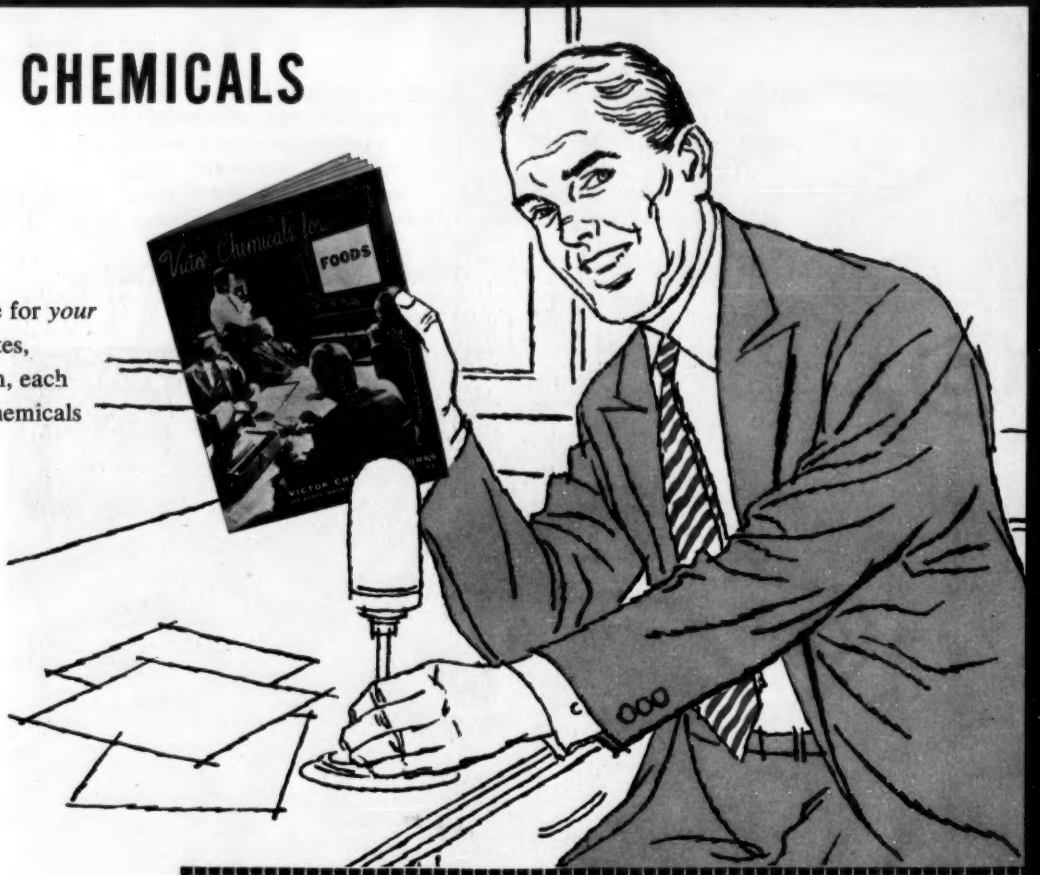
PHOSPHATES keep "Dad" off the bench

Food fortified with Victor phosphates help proud papas keep pace with active sons. With tremendous appeal to homemakers, many mineralized foods literally "sell" themselves. Today, cereals, baby foods, milk drinks and bread are among the many food products fortified with Victor phosphates.

Victor calcium and iron phosphates may be added to foods at practically no cost. For full details, send for the free Victafile on Foods and Beverages. It pays to see Victor.

NEW FACTS ABOUT VICTOR CHEMICALS FOR YOUR INDUSTRY...

Here's a brand-new concept in chemical literature that's tailor-made for *your* industry. Each Victafile contains complete data on Victor phosphates, formates, and oxalates used in *your* industry. In simple, concise form, each Victafile provides important technical information on the Victor chemicals you can use to cut costs, increase production, or add sales appeal.



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☐ We have a particular problem; if there's no obligation, please have technical service representative call.

Housewives Are Beating Pros to the Seat

To specialties makers, upholstery has for many years been just a word to put on the list of uses for wide-range cleaning products. Now, however, it is beginning to be appreciated as a distinct market, with problems and needs all its own. First explorers into this area of marketing liked what they saw well enough that they are now busily oiling their advertising guns for a return in the fall—the next big season.

Sales leader Glamorene, in fact, this summer will direct an advertising campaign at automobile owners, expected to become a significant part of the upholstery cleaner market.

Since only one product—made by Glamorene, Inc. (New York)—is promoted as an exclusive upholstery cleaner, nobody has any real idea of the market for this sort of thing. Most agree that upholstery runs second to carpets in sparking sales of combination do-it-yourself rug and upholstery cleaners. These combination cleaners have estimated annual sales of over $20 million—are the current favorites for winning a sales race among a variety of products, including soaps, wash-day detergents, powders, and spot-remover "dry" cleaners.

Pros and Cons: Do-it-yourself upholstery cleaning products are wrestling with professional cleaners for business. The home products' big advantage, of course, is price; the pros charge up to $25-30 for a job. But they offer a thorough cleaning job the housewife can seldom match, and tend to ease her fears that the fabric might be harmed by cleaning.

Unlike professional rug cleaners, the professional upholstery cleaners have mounted no organized effort to combat the home products. Some, however, have been known to play strongly upon the housewives' fear of damage. They blame previous home-cleaning attempts for unremovable stains or poor work on their own part.

And upholstery, unlike carpets (which professionals usually take out of the home to clean), is often cleaned on the spot. This deprives professional upholstery cleaners of an element of mystery that the rug cleaners savor. When the housewife sees the upholstery serviceman apparently doing what she could have done herself, with what looks like (and often is) the same product, she is encouraged to try her own hand at it next time.

Dry Foam: Although upholstery can be cleaned with an ordinary wash-day detergent (e.g., Tide or Fab), best and easiest results require some qualities of a special cleaner. Most important, the cleaner should:

Do you make

PAINTS

PLASTICS

PRINTING INKS

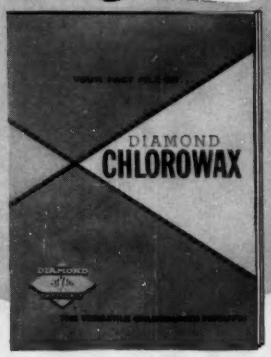
RUBBER PRODUCTS

ADHESIVES

MASTICS

FABRIC FINISHES

?



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Cheap fabrics poorly dyed are almost impossible to clean satisfactorily with any of the cleaners. Also, the wide range of fabrics used in upholstery introduces an element of risk. Most fabrics used are of cotton or wool, but virtually all textiles find some use. Some, like velvet, just won't take the cleaners.

It is important to keep upholstery as dry as possible (lest moisture seep into the padding), but in spite of this most liquid cleaners sell better than powder types. Powder-ene, made by Van Schrader Mfg. Co. (Racine, Wis.) is probably the most prominent exception to this rule. A newcomer, which combines features of both powder and liquid, is also worth watching: Lustr-Glo, made by Lustr-Glo, Inc., Evanston, Ill. (*CW, Nov. 5, '55, p. 62*).

To Each Its Own: Glamorene, the biggest seller in rug cleaners, does not recommend its powder for upholstery, offers instead two liquid products. Two years ago it introduced a straight upholstery cleaner consisting of a light detergent, and last September it offered a combination rug and upholstery cleaner containing a suspension agent to "float" the dirt until it can be removed. Both of the new products have captured substantial portions of the over-all market, although they have received little individual promotion; apparently they have been "carried" by the well-publicized rug cleaner. Also, reports Glamorene, both of the liquid products seem to be finding new markets of their own, rather than cutting in on the powder.

Other popular liquids, generally of the detergent or shampoo type, include: Vapoo (Vapoo Products Co., New York); O-Cedar (O-Cedar Corp., Chicago); Des-Tex Foam (Research Des-Tex, Inc., Evanston, Ill.); Carbona Instant Foam Lather (an aerosol made by Carbona Products Co., Long Island City, N.Y.); Instant Mystic Foam (Mystic Foam Corp., Cleveland); Nu-Sheen (Donco Products Co., Los Angeles); Old English Rug Shampoo (Boyle-Midway, Jersey City, N.J.); Easy Glamur (Glamur Products, Inc., Syracuse, N.Y.); and Rad (Milrose Products Co., New York). Although Glamorene's products are the sales leaders on a national level, they are often outsold in individual markets, usually by a local product.

Where's the Dirt? Promoters of these products often advertise that "dirt disappears like magic." There is some difference of opinion as to where the dirt goes. Although in some cases it is sunk below the surface into the interior of the cushion, in better products it is held in suspension on the surface, waiting to be carried away, either by vacuuming or, with patience, by ordinary traffic.

Several cleaners add a "soil retardant," though not usually of a silica type. One maker of a retardant-containing cleaner privately concedes that it is more of an advertising gimmick than anything else.

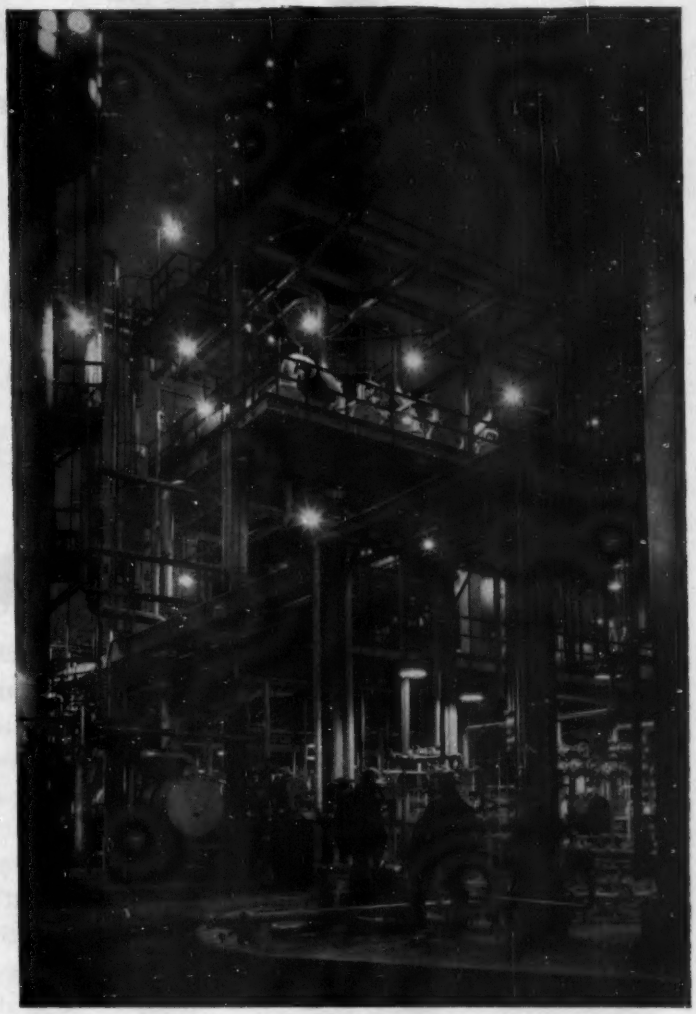
On the Road: The automobile market is expected to blossom out this year. Several attempts have been made to sell upholstery cleaners to car owners in the past, but usually little came of those efforts. Principal reasons seemed to be the prevalent use of seat covers, plus the lack of a woman's influence. The biggest try for this market was made in behalf of Easy Glamus, which was originally sold through hardware and auto supply stores — with little success because male customers of these outlets just don't buy cleaners.

Several signs point to better luck this year. For one thing, as automobile upholstery becomes more attractive and more durable, people are more reluctant to cover it with seat covers. This year, for the first time, most hard-top models have plastic or leather upholstery—materials that can benefit from upholstery cleaners. Several automobile makers, in fact, are testing the cleaners now, may add them to dealers' accessory lines.

The more colorful and lighter-colored fabrics taking over in home upholstery also require more frequent cleaning (because of less use of slip covers) than do previously popular fabrics.

Most makers feel that the greatest inhibitor of sales is not professional cleaners, slip covers or competitors, but rather the fact that people often don't realize how dirty their furniture is. Promotion of this idea could open up a market that, they believe, is almost untapped.

ON-STREAM...DAY AND NIGHT



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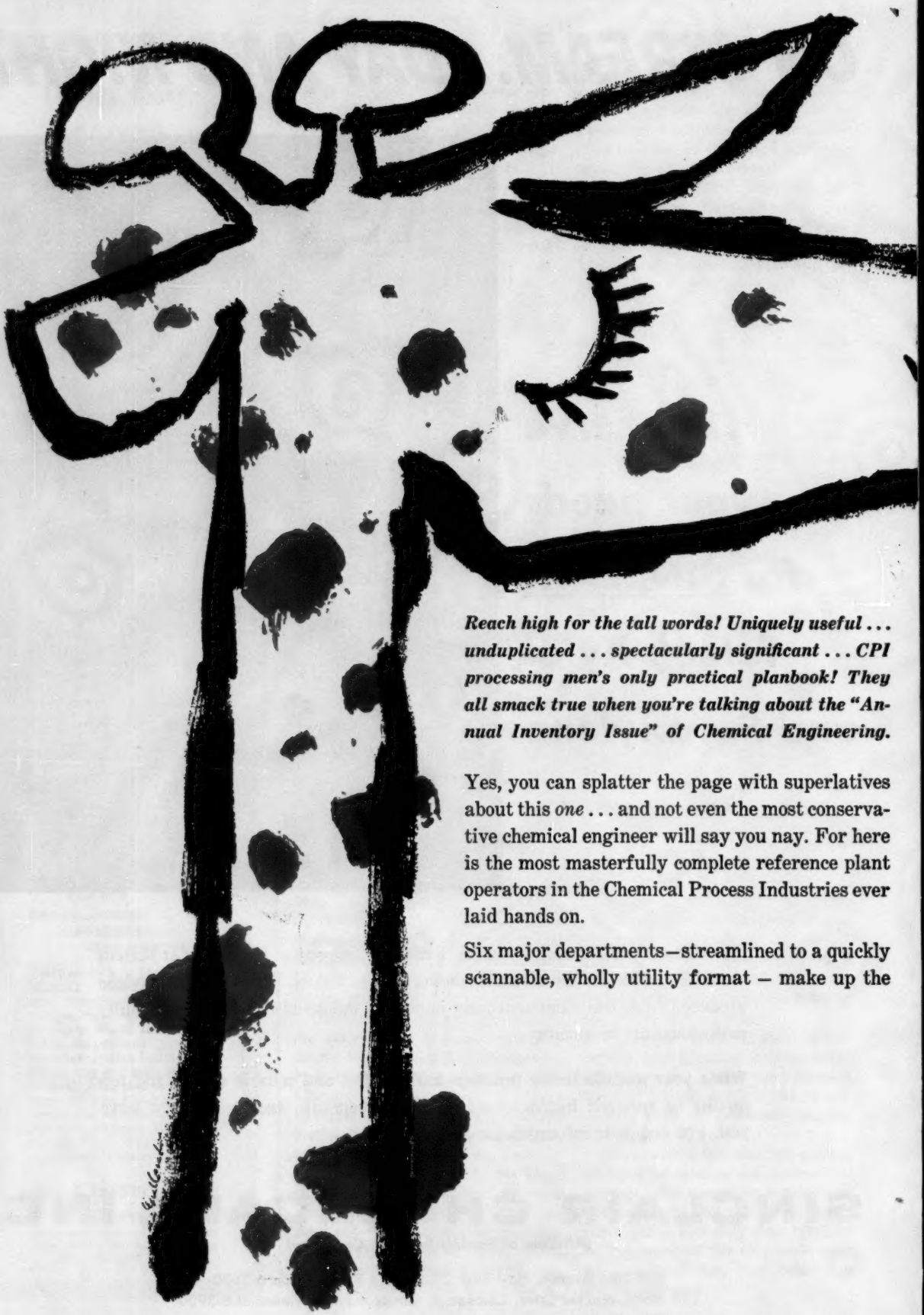

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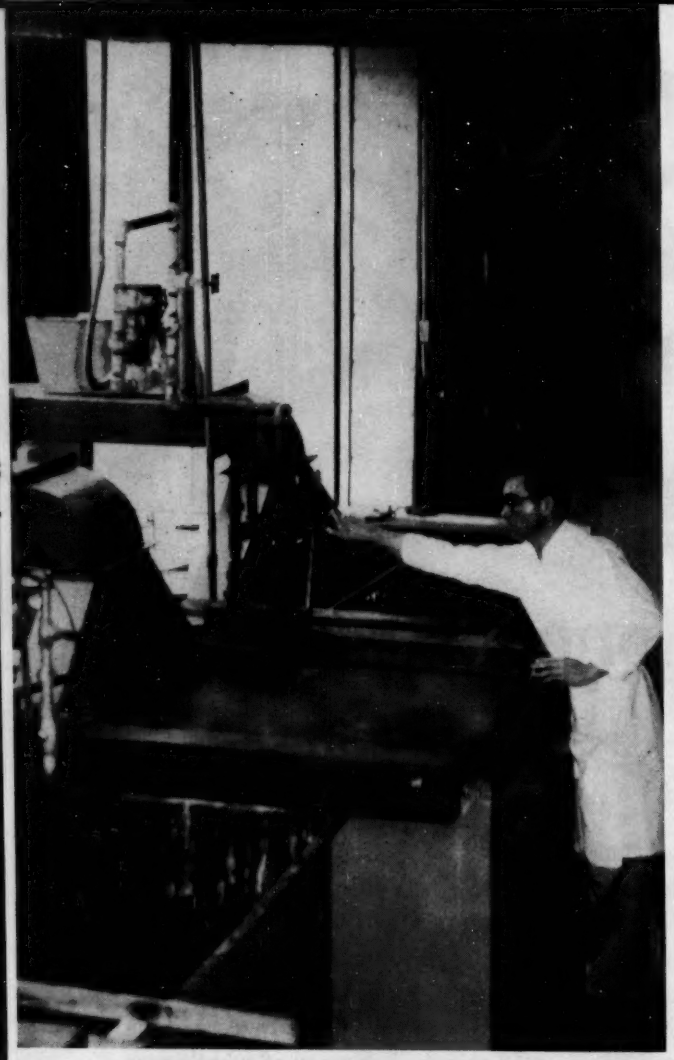
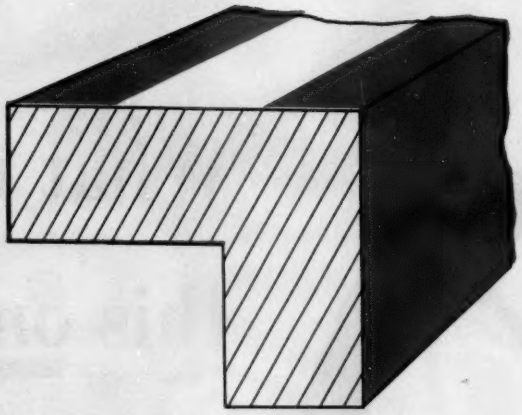


MILLING TANK: Cutting a place for itself in metal parts-making, chemical etching gets jobs machines can't do.

Chemical Solution for Metal Shaping Problems



1 Apply protective film to metal, immerse in etching solution

WITH THE issuance of U.S. Pat. 2,739,047 to North American Aviation (Los Angeles), much of the technological smog surrounding the NAA-Turco process of Chem Milling has been blown away. Already in common use at North American, as well as at 32 sublicensed airframe and component plants (and soon at the two big holdouts—Convair and Douglas), the system plays a vital role in military plane construction.

Developed for application to most metals, Chem Milling has shown itself particularly well suited for work with titanium, a metal much more difficult to handle than aluminum or steel (perhaps because proper techniques have yet to be learned). So far, the process is in the production stage for aluminum only, but a pilot plant for titanium, magnesium and steel has just been built.

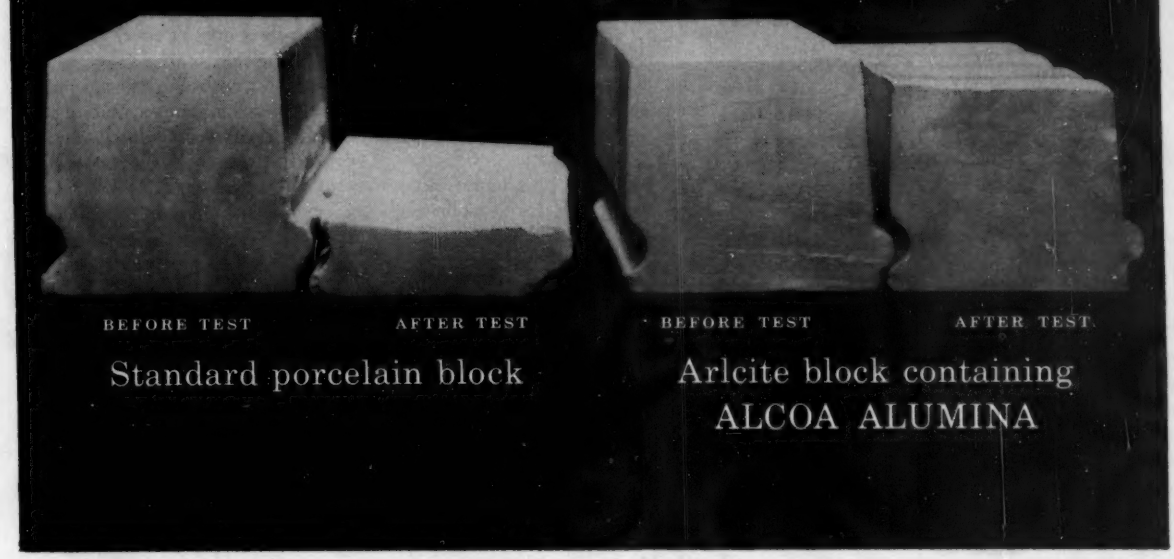
As the patent points out, use of etching solutions for metal-forming isn't brand-new. Bearing metals have been etched; and Westinghouse devised a way to produce tapering-thickness instrument pointers by etching. The market for Chem Milling—which is rapidly approaching $1 million/year—is being built on several refinements of the old techniques.

Chem Milling forms parts that could not easily be made in other ways. For example, a thin-walled part, such as a rocket booster casing, could be mechanically milled, then stamped and welded. But this involves some rather difficult operations (particularly when thin metal has been milled), and distortion isn't uncommon. By using Chem Milling, the thick metal can be shaped and welded, then etched to provide the cutaway portions.

Printed Patterns: In the accompanying drawings—greatly simplified, and with some exaggerated features—some of the advantages of the process are shown. Application of the masking, etchproof coat can be done in a number of ways—by stenciling, drawing, painting or printing. Vinyl films are suggested as protective materials, but other things, such as photosensitive gelatines, can be used. As illustrated, the pattern must be

Here's proof

ALCOA Alumina doubles –even triples– the life of ceramic mill liners



Standard porcelain block

Arlcite block containing ALCOA ALUMINA

▼ **The first and third blocks from the left, shown above, were used to line a mill in which accelerated grinding tests were conducted. The same blocks, after test, are beside the originals. Note how abrasive action in grinding has seriously worn away the standard porcelain, yet has had little effect on the Arlcite block. Arlcite, manufactured by The Patterson Foundry & Machine Company, East Liverpool, Ohio, is a high density ceramic, the principal ingredient of which is ALCOA Alumina.**

As the pioneer commercial producer of high density mill linings, lifter bars and grinding media, Patterson recognized the value of ALCOA Alumina in ceramics when production was started in 1938. Its extraordinary toughness and abrasion resistance made it a natural choice for Arlcite.

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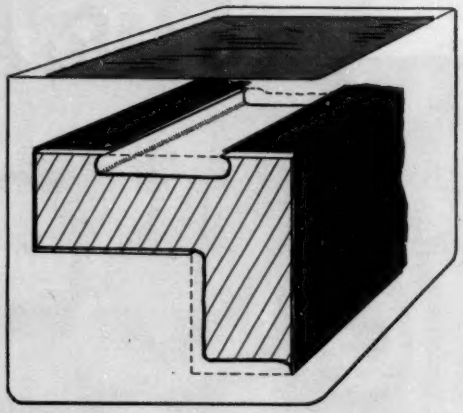


2 Solution eats unprotected metal, even under edge of protective masking

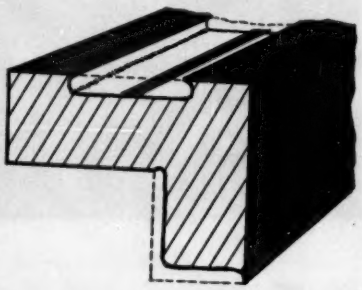
made somewhat larger than the area it is to block out. The etching solution doesn't only eat downward; it also eats under the edge of the masking. The degree of this is easily determined, and accuracy of 0.002 in. is achieved on parts, since temperature, time and strength of the solution can be controlled to a precise degree.

After a portion of the etching has been done, the part may be withdrawn, washed, and coated again with the masking material. It can then be returned to the etching bath, and further "milling" done (Fig. III).

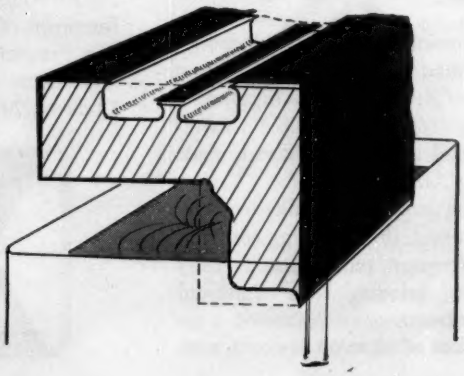
Besides making milling cuts of varying depth, the chemical milling process can be adapted to produce a taper. This is done simply by slowly removing the part from the bath—speed of withdrawal determines the angle.

Tough Mask: The process can be combined with other processes—a sheet of steel, for example, could be stamped, rolled, welded, lathe-turned, then Chem-Milled. By selection of the proper adherent masking, this coating may be applied before any of the other operations.

The patent doesn't cover exact composition of the etching solutions, nor the specific instruments and equipment for maintaining solution concentrations and temperatures, and for regulating time of immersions—all factors of importance, but which are easily solved on the spot for individual problems. As much as anything, the versatility of the process has contributed to its success.

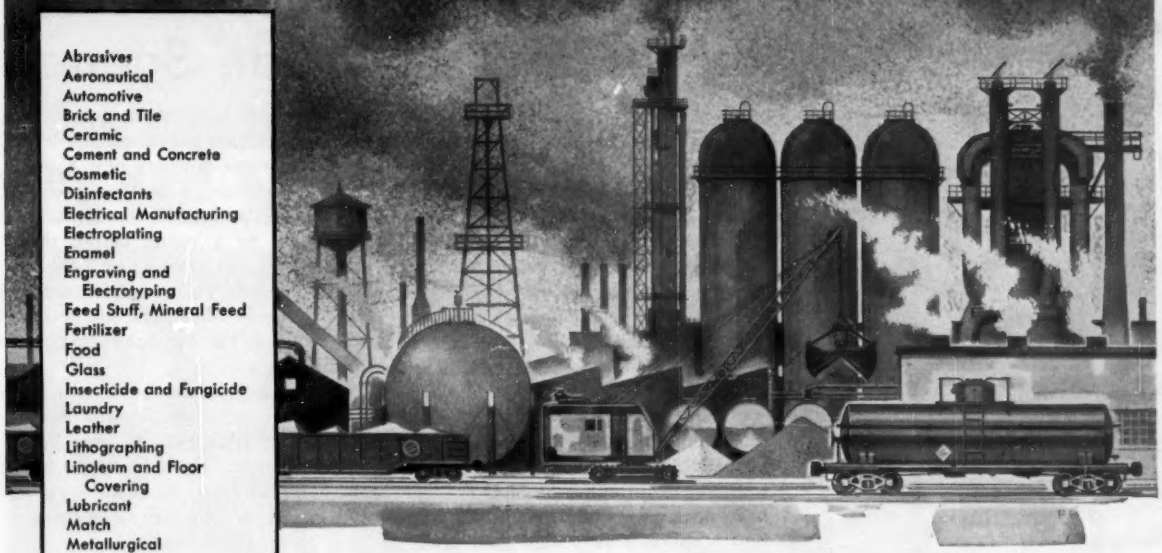


3 Remove from etch bath, apply second layer of coating and return to etch bath



4 Taper results when part is slowly removed from bath

IS YOUR INDUSTRY LISTED HERE?



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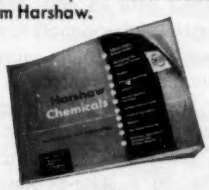

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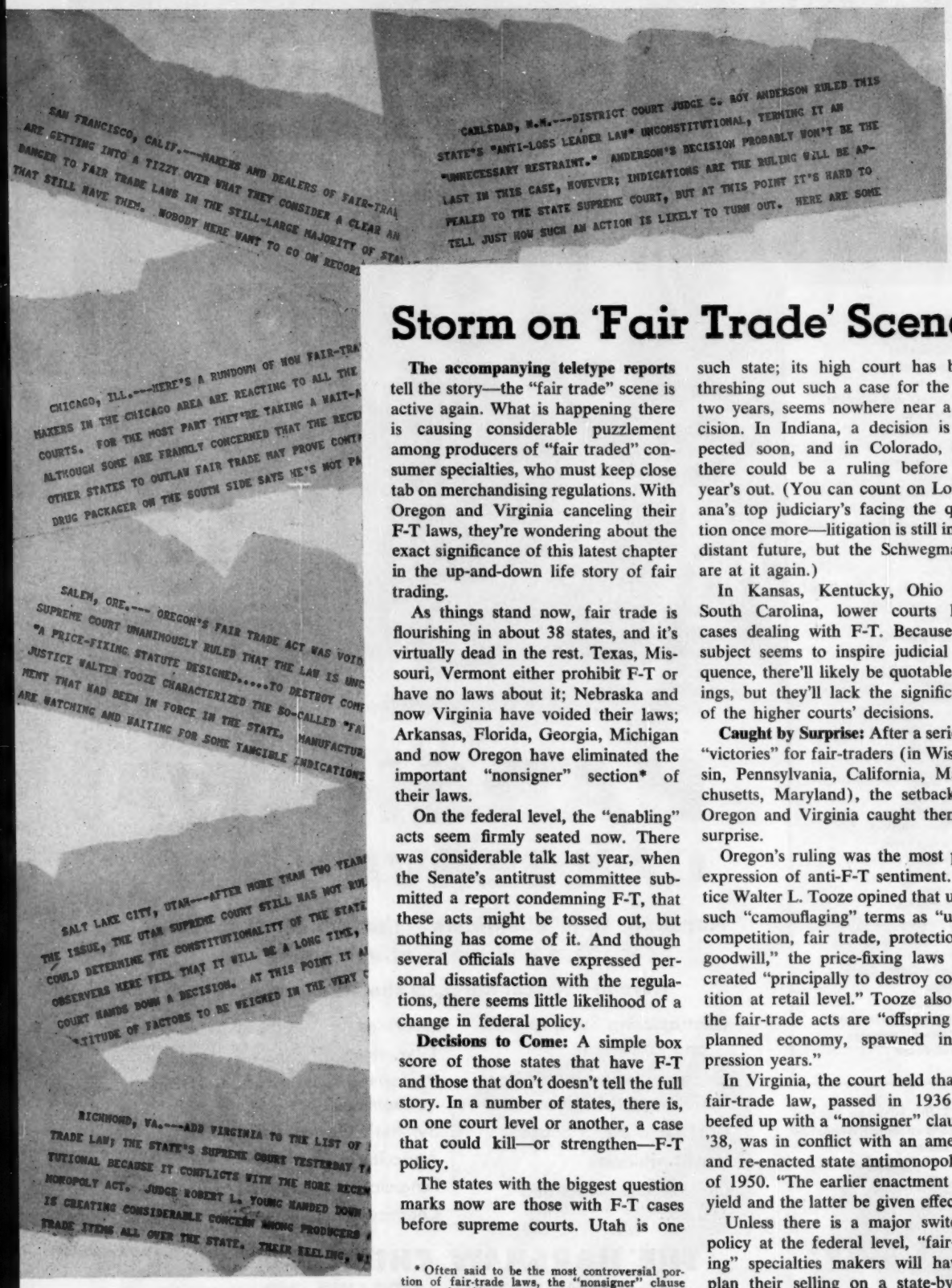


SAN FRANCISCO, CALIF.---MAKERS AND DEALERS OF FAIR-TRA
ARE GETTING INTO A TIZZY OVER WHAT THEY CONSIDER A CLEAR AN
DANGER TO FAIR TRADE LAWS IN THE STILL-LARGE MAJORITY OF STA
THAT STILL HAVE THEM. NOBODY HERE WANT TO GO ON RECORI

CARLSBAD, N.M.---DISTRICT COURT JUDGE C. ROY ANDERSON RULED THIS
STATE'S "ANTI-LOSS LEADER LAW" UNCONSTITUTIONAL, TERMING IT AN
"UNNECESSARY RESTRAINT." ANDERSON'S DECISION PROBABLY WON'T BE THE
LAST IN THIS CASE, HOWEVER; INDICATIONS ARE THE RULING WILL BE AP-
PEALED TO THE STATE SUPREME COURT, BUT AT THIS POINT IT'S HARD TO
TELL JUST HOW SUCH AN ACTION IS LIKELY TO TURN OUT. HERE ARE SOME

CHICAGO, ILL.---HERE'S A RUNDOWN OF HOW FAIR-TRA
MAKERS IN THE CHICAGO AREA ARE REACTING TO ALL THE
COURTS. FOR THE MOST PART THEY'RE TAKING A WAIT-A
ALTHOUGH SOME ARE FRANKLY CONCERNED THAT THE RECE
OTHER STATES TO OUTLAW FAIR TRADE MAY PROVE CONT
DRUG PACKAGER ON THE SOUTH SIDE SAYS HE'S NOT PA

SALEM, ORE.--- OREGON'S FAIR TRADE ACT WAS VOID
SUPREME COURT UNANIMOUSLY RULED THAT THE LAW IS UNC
"A PRICE-FIXING STATUTE DESIGNED.....TO DESTROY COMP
JUSTICE WALTER TOOZE CHARACTERIZED THE SO-CALLED "FA
MENT THAT HAD BEEN IN FORCE IN THE STATE. MANUFACTUR
ARE WATCHING AND WAITING FOR SOME TANGIBLE INDICATIONS

SALT LAKE CITY, UTAH---AFTER MORE THAN TWO YEARS
THE ISSUE, THE UTAH SUPREME COURT STILL HAS NOT RUL
COULD DETERMINE THE CONSTITUTIONALITY OF THE STATE
OBSERVERS HERE FEEL THAT IT WILL BE A LONG TIME,
COURT HANDS DOWN A DECISION. AT THIS POINT IT A
TITUDE OF FACTORS TO BE WEIGHED IN THE VERY

RICHMOND, VA.---ADD VIRGINIA TO THE LIST OF
TRADE LAW; THE STATE'S SUPREME COURT YESTERDAY
TUTIONAL BECAUSE IT CONFLICTS WITH THE MORE RECEN
MONOPOLY ACT. JUDGE ROBERT L. YOUNG HANDED DOWN
IS CREATING CONSIDERABLE CONCERN AMONG PRODUCERS
TRADE ITEMS ALL OVER THE STATE. THEIR FEELING,

Storm on 'Fair Trade' Scene

The accompanying teletype reports tell the story—the "fair trade" scene is active again. What is happening there is causing considerable puzzlement among producers of "fair traded" consumer specialties, who must keep close tab on merchandising regulations. With Oregon and Virginia canceling their F-T laws, they're wondering about the exact significance of this latest chapter in the up-and-down life story of fair trading.

As things stand now, fair trade is flourishing in about 38 states, and it's virtually dead in the rest. Texas, Missouri, Vermont either prohibit F-T or have no laws about it; Nebraska and now Virginia have voided their laws; Arkansas, Florida, Georgia, Michigan and now Oregon have eliminated the important "nonsigner" section* of their laws.

On the federal level, the "enabling" acts seem firmly seated now. There was considerable talk last year, when the Senate's antitrust committee submitted a report condemning F-T, that these acts might be tossed out, but nothing has come of it. And though several officials have expressed personal dissatisfaction with the regulations, there seems little likelihood of a change in federal policy.

Decisions to Come: A simple box score of those states that have F-T and those that don't doesn't tell the full story. In a number of states, there is, on one court level or another, a case that could kill—or strengthen—F-T policy.

The states with the biggest question marks now are those with F-T cases before supreme courts. Utah is one such state; its high court has been threshing out such a case for the last two years, seems nowhere near a decision. In Indiana, a decision is expected soon, and in Colorado, too, there could be a ruling before the year's out. (You can count on Louisiana's top judiciary's facing the question once more—litigation is still in the distant future, but the Schwegmanns are at it again.)

In Kansas, Kentucky, Ohio and South Carolina, lower courts have cases dealing with F-T. Because the subject seems to inspire judicial eloquence, there'll likely be quotable rulings, but they'll lack the significance of the higher courts' decisions.

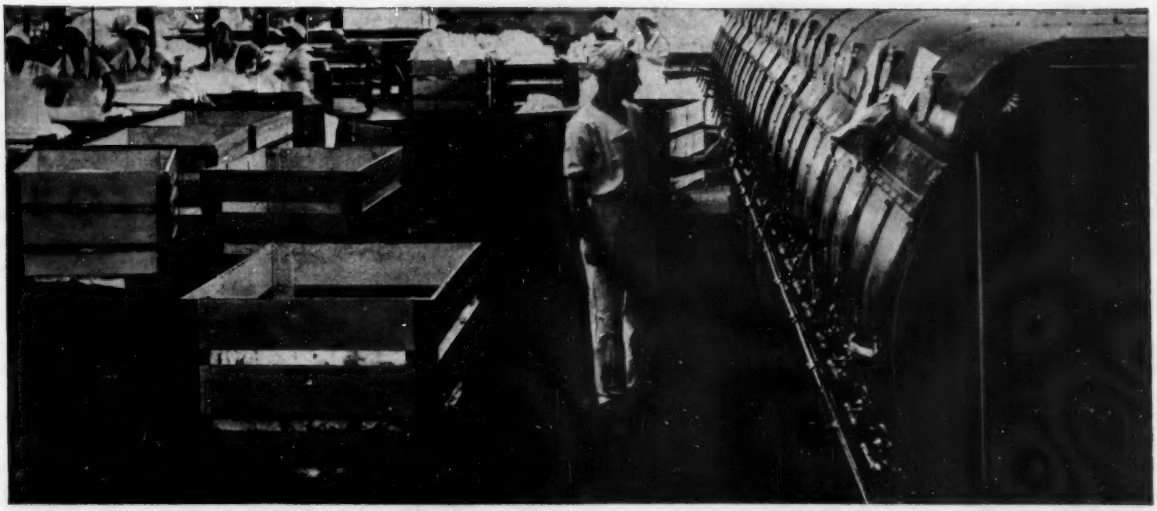
Caught by Surprise: After a series of "victories" for fair-traders (in Wisconsin, Pennsylvania, California, Massachusetts, Maryland), the setbacks in Oregon and Virginia caught them by surprise.

Oregon's ruling was the most plain expression of anti-F-T sentiment. Justice Walter L. Tooze opined that under such "camouflaging" terms as "unfair competition, fair trade, protection of goodwill," the price-fixing laws were created "principally to destroy competition at retail level." Tooze also said the fair-trade acts are "offspring of a planned economy, spawned in depression years."

In Virginia, the court held that the fair-trade law, passed in 1936 and beefed up with a "nonsigner" clause in '38, was in conflict with an amended and re-enacted state antimonopoly act of 1950. "The earlier enactment must yield and the latter be given effect."

Unless there is a major switch in policy at the federal level, "fair-trading" specialties makers will have to plan their selling on a state-by-state basis, and be prepared to make revisions often.

* Often said to be the most controversial portion of fair-trade laws, the "nonsigner" clause means that if a manufacturer and any one retailer in a state sign a price-fixing agreement, then the other retailers must abide by those same prices.



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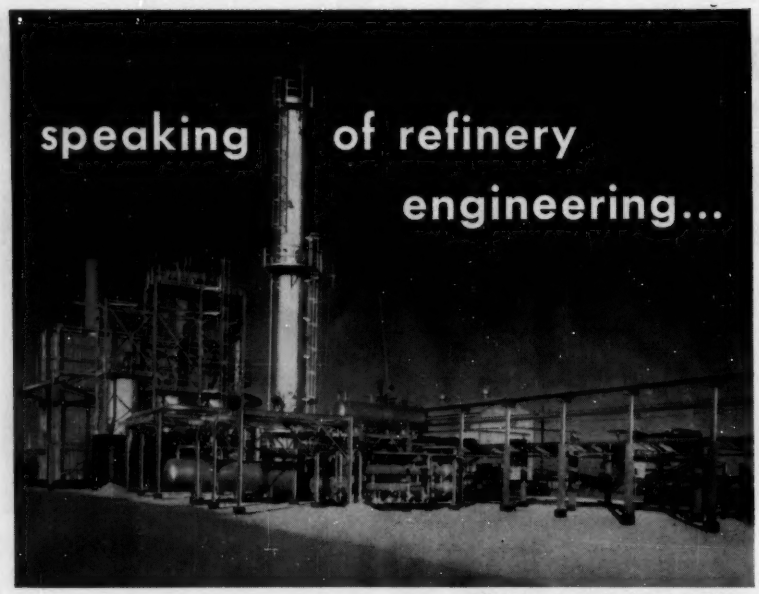

Platformer designed and constructed for National Cooperative Refinery Association, McPherson, Kansas

THE Refinery Engineering Company of Tulsa, Okla., generally known as TRECO, is one of the most successful companies in the engineering, design and construction of refineries and petrochemical plants. TRECO specializes in the construction of oil refineries, natural gasoline and petroleum by-product chemical plants and similar installations. It designed and built, for instance, the first integrated shale oil plant and the first remote-controlled automatic booster station for a gas pipeline. Recent contracts of significance have included units for Continental Oil, Shell Oil, and The Texas Company. TRECO's reputation is outstanding for completion of facilities ahead of schedule.

TRECO is a division of Vitro Corporation of America. When Vitro acquired that operation recently it not only broadened the base of its engineering services, but acquired a construction arm for the first time. Vitro enjoys a wide reputation for excellence in processing and technical engineering and design, but it has not previously included construction among its services. Close relations with Vitro Engineering Division give TRECO important new insights into the engineering problems of the various nuclear and other processing fields and a consequent diversification of its activities.

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SPECIALTIES

EXPANSION

Division of Duty: Rockford Paint Mfg. Co. (Rockford, Ill.) has acquired the retail stores and trade sales organization of Pontiac Varnish Co. (Pontiac, Mich.). The Rockford firm will make and sell enamels and varnishes under the Pontiac label, will also continue to produce its own line of coatings.

Pontiac will concentrate on industrial products, taking over the markets now served by Rockford.

•

Beauty Aids: Raymond Laboratories, Inc. (St. Paul, Minn.) has become the fourth U.S. commercial source of thioglycolic acid and its salts (with Evans Chemetics, New York; Halby Co., Wilmington, Del.; and Summit Chemical Co., Belleville, N.J.). Salts of thioglycolic acid are used as active ingredients in cold-wave preparations (*CW, April 14, p. 44*). The 20-year-old maker of beauty aids (specializing in hair products) is also now selling sodium lauryl sulfate, basic in cream shampoos, and widely used as an emulsifier, and quaternary ammonium compounds, used as disinfectants, wetting agents and detergents. Raymond is looking for new applications for these products, especially in the industrial field. One more product will be added to the firm's industrial catalog when its new sodium bromate plant goes onstream this month.

PRODUCTS

Put-Away Protection: The season for storing winter woolens is here—and Plasti-Kote, Inc. (Cleveland) is now selling an aerosol mothproof spray. The 12-oz., strobane-base spray retails for $1.69.

•

Shampoo Special: A new type of raw material for shampoo formulation is being introduced by American Alcolac Corp. (Baltimore). Tagged Sipon ES, it's a sodium lauryl ether sulfate. Designed to complement the firm's line of lauryl sulfates, the Sipon ES is said to have such desirable features as a very low cloud point, "clear" solubility in hardest water, and excellent foaming characteristics.

Production of this anionic syndet is still in the pilot-lot stage, but commercial production is expected within weeks.

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Of particular current interest are Becco epoxidation processes. One process produces epoxidized compounds of extremely low iodine number. Another is a catalyzed *in situ* process giving high yields at low cost and low investment. It offers a choice of catalysts, among them ion exchange resins. So little catalyst may be used that it can be discarded economically after each run.

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Over 1½ miles of screen printing tables are installed at Ahern Textile Print, Inc., Norwich, Conn. The fine fabrics used are bleached with Becco Hydrogen Peroxide; printed fabrics color fixed with Becco Hydrogen Peroxide or Sodium Perborate.

Most people think hydrogen peroxide is used principally as a hair bleach. Actually, only a small portion of the production of Becco Hydrogen Peroxide is used in cosmetics.

Germfree monkey in a germfree cage gets a germfree lunch from a germfree hand at Lobund Institute, University of Notre Dame. Sterile conditions from birth permit the study of the effects of single germ types. Becco Peracetic Acid has been found useful in some phases of this germfree research.

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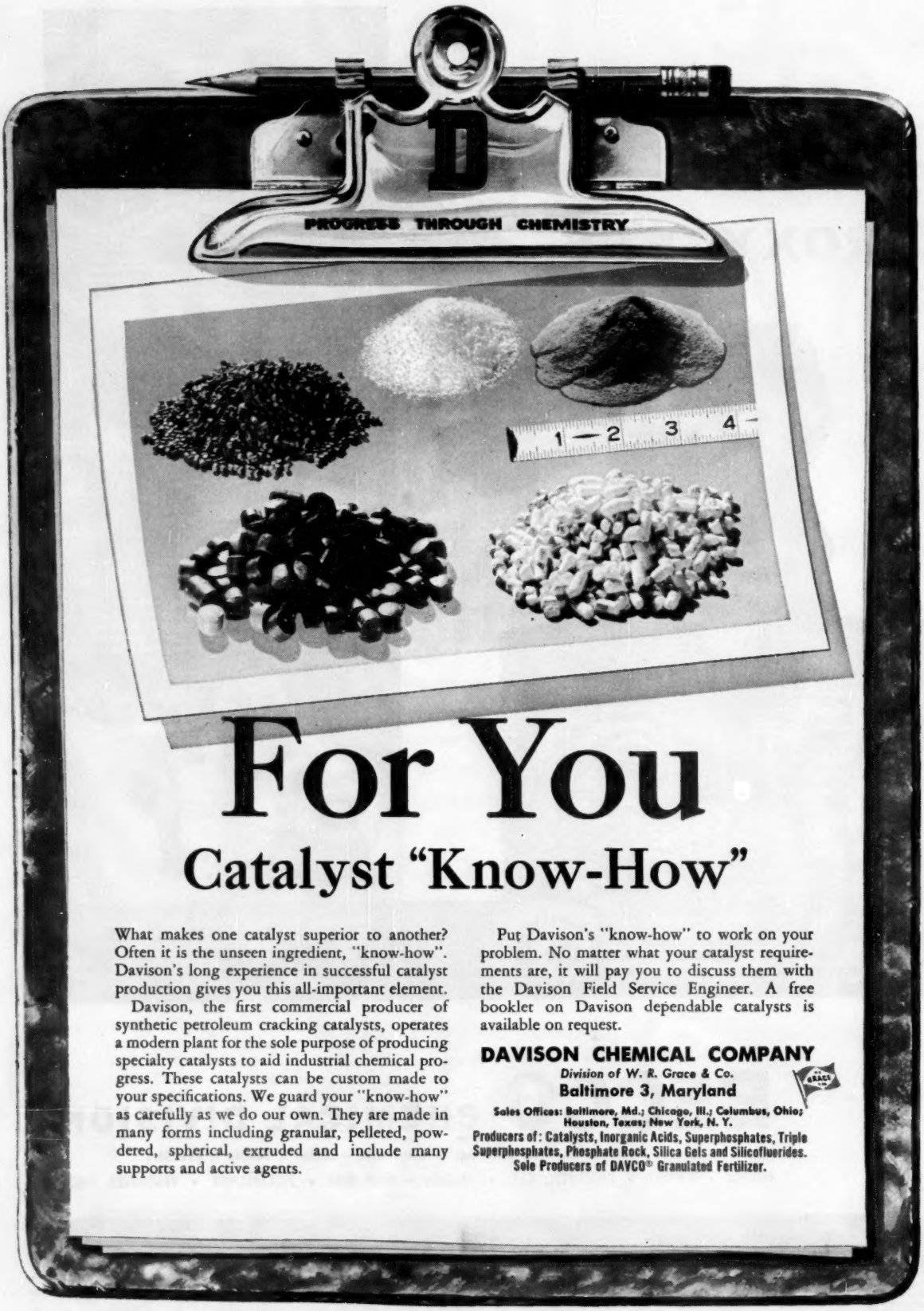

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CHEMICAL WEEK
May 26, 1956

Watch for word shortly about a new development by Olin Mathieson on generation of chlorine dioxide. OM has found a way of getting substantially quantitative yields from sodium chlorate.

The savings in pulp bleaching promise to be considerable. For instance, mill tests recently completed indicate savings of $8,000/year per ton-day of chlorine dioxide produced. In a plant using 10 tons/day, that would add up to an annual saving of $80,000.

•

The chemical industry's contribution to air pollution in the Houston area will be delineated as a result of the Houston Chamber of Commerce decision last week to hire Southwest Research Institute for a study of the problem. The Chamber of Commerce anted up $125,000 for a one-year investigation. If needed, however, it will extend the project into a second year (for $35,000).

The study will revolve around meteorological investigations, atmospheric analyses and probes of potential damage to vegetation. It's primarily intended to assess the problem and compare it with pollution elsewhere in the country.

•

There's lots of room for more research on coal. That's the essence of a Bureau of Mines 52-page report issued late last week. In cooperation with industry's Bituminous Coal Research, Inc., it found that only $17 million was spent on coal research in 1955. And most of that went for development and improvement of equipment.

Some of the areas where research efforts could be stepped up, it suggests, are nuclear gasification of coal, low-temperature carbonization, production of high-heat-value gas from coal, fine-coal cleaning, underground handling and transporting of coal. It also thinks a lot should be done in the way of basic research on the structure and properties of coal.

•

A tripling of the market for vinyl chloride in such items as garden hose will result from a new light-stabilizing system being introduced by Monsanto this week. That, at least, is how the firm sees it.

The new system is made up of four parts: (1) barium-cadmium salts of organic acids; (2) an epoxidized soybean oil; (3) an anti-oxidant; (4) an unidentified organic additive. It's the organic additive that's the clue to the system's success, although Monsanto makes it plain that leaving out any one of the four components significantly impairs the effectiveness.

Actual sunlight and weathering tests have not yet been completed, but vinyl chloride stabilized with the new system has withstood 5,600 hours of accelerated artificial weathering before failure.

•

And a new vinyl plasticizer out of Monsanto is expected to broaden the use of vinyls in other fields. The new product, Santicizer 213, a modified

phthalate, is designed to reduce the "tack" of polyvinyl chloride products. (Tack is the tendency to adhere; it can be a headache to packagers.)

The new plasticizer will be unveiled next month at the annual Plastics Show of the Society of the Plastics Industry. Although still in the development stage, the product is being readied for volume production. It will sell for 28¢/lb. (f.o.b., St. Louis).

•

Now you can make high-pressure polyethylene more rigid by blending mineral wax. An article in *Kunststoffe,* a West German journal, describes test results of adding FT mineral waxes, which are said to be compatible in all proportions with polyethylene. In addition to contributing rigidity, the waxes are said to improve the plastic's transmission of some gases and vapors.

Made by synthesis gas, FT waxes are microcrystalline in nature. They're sold in this country by Dura Commodities (New York).

•

General Electric has received a permit from the Atomic Energy Commission to build a developmental boiling water reactor at its new atomic laboratory in Alameda County, California. It will be used to provide technical data for the full-scale reactor that GE is going to put up in Grundy County, Illinois, for Commonwealth Edison of Chicago.

The small unit will operate on an enriched uranium fuel at 3,000 kw., initially. But GE plans to increase the output and—ultimately—to sell the power generated by the unit to Pacific Gas and Electric for distribution.

Still subject to a "Hazards Summary Report," the California reactor is scheduled for completion sometime between the first of June next year and the end of Feb. '58.

•

Nuclear fuel elements will be made and tested in a new plant, started up last week, by Babcock & Wilcox. Located in Lynchburg, Va., the plant is the first major one of its kind built entirely by private money. It's divided into two parts: a nuclear fabrication unit and an experimental area where reactor core components will be studied.

The latter portion is not yet completed. Its first job will be to "determine the nuclear characteristics" of the Consolidated Edison reactor which B&W will design and erect. On a small scale, it will test thorium as a fuel component.

Right now, the fabrication portion is working on flat-plate fuel elements, but eventually the firm expects to make pin, rod and cylindrical fuel elements, too.

•

Chemical Process Co. (Redwood City, Calif.) will soon start to market a series of new styrene-base, highly porous and strongly basic anion-exchange resins. The Duolite A-100 series, they'll vie with Rohm & Haas' Amerlite IR A-400 and 401 and Permutit's S-1 and S-2 for jobs in mixed-bed deionization of water, and other applications. They're made by a process that, Chempro states, will not infringe on any patent.

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ON THE JOB: Student William Wallace records data from National Aluminate laboratory boilers, frees full-time researcher for creative work. His salary: $250/month. It all explains . . .

Why Part-Timers Are Winning New Friends

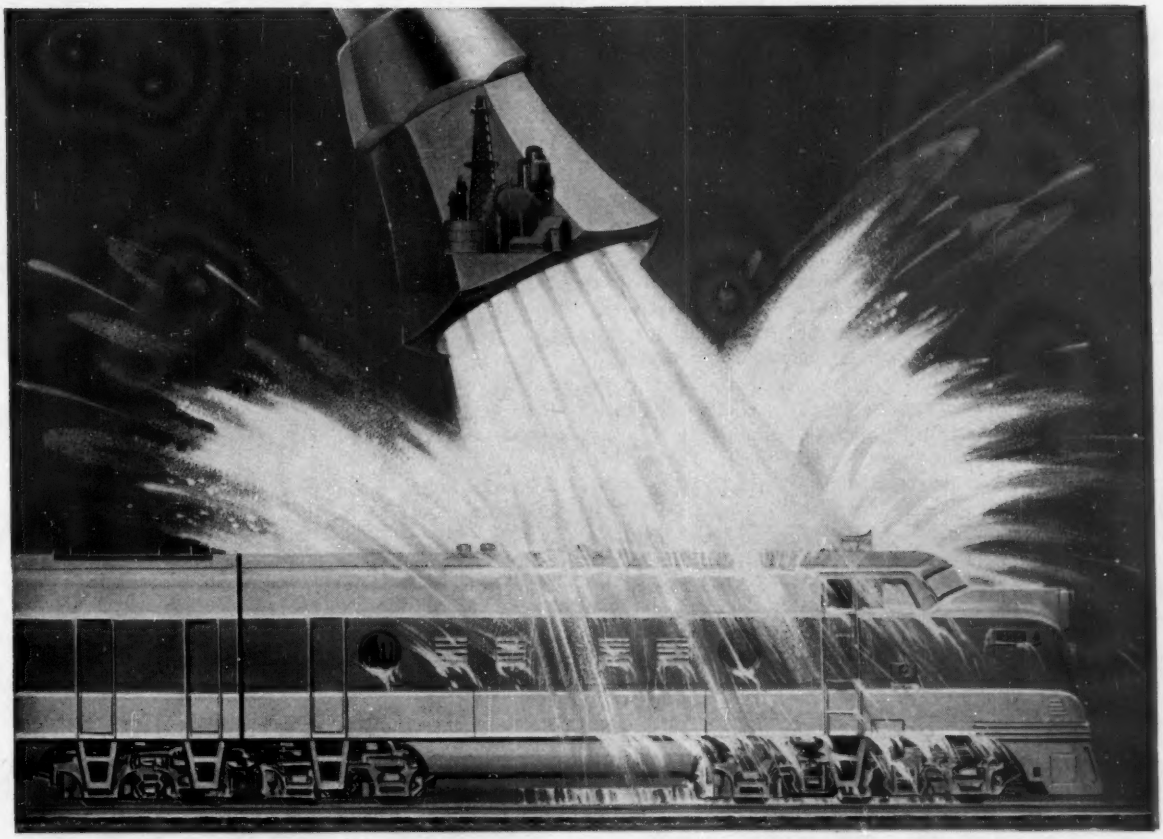
AT SCHOOL: Learning is like doing.

Twenty-year-old William Wallace, a chemical engineering student* by day, gets paid $250/month to help keep National Aluminate Corp.'s (Chicago) laboratory program going at night. Like many other students and teachers, he's cashing in on the increasing demand for part-time researchers in the chemical industry. These interim employees—who work evenings, weekends and summers—now comprise a significant chunk of research manpower, and they're destined to become even more important.

Hiring part-timers owes its increasing popularity primarily to two reasons: it's an excellent recruiting device; and it gives firms a good look at a potential employees' capabilities. But other factors almost equal to these in importance are:

- Part-timers help keep operations running smoothly when regular employees are on vacation.
- They can keep equipment going at night when the regulars are off duty.
- Regulars get more time for productive work.
- Hiring part-timers is a good route to goodwill.
- Hobart Thomas (*see cut on page 76*), who is

*At Illinois Institute of Technology (Chicago).



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These superior synthetic detergents are one of a group of Atlantic petrochemicals (so you see a miniature oil refinery in the picture).

Naturally, these unusually able Ultrawets are also used in formulations for many other operations: from shampoos for milady to wetting agents in textile mills.

The Ultrawets are one part of Atlantic's ever-growing family of petrochemicals, for which industry is constantly finding new and profitable uses . . . in new products . . . in cost-saving manufacturing advantages . . . in adding new sales-pluses to well-established products. Atlantic sales engineers are always ready to help your staff get the most from your use of Atlantic petrochemicals.

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assistant to Stauffer Chemical Co.'s vice-president for research (Chester Arnold), sums up the case for the part-timers this way:

"Not only do part-timers provide extra hands, but they also provide (and gain) experience and points of view that can be mutually valuable. At the same time, we get a look at some employable candidates. We have picked up some very good men by watching their progress through school and part-time work with us."

J. Fred Wilkes, research director of Dearborn Chemical Co. (Chicago), agrees that student part-timers are an aid (depending on individual ability and good supervision), says they also provide "an early connection with men we might want to hire, somewhat offsetting the keen competition for researchers."

And International Minerals and Chemical Corp.'s director of research, I. M. LeBaron, points out that "they're a whale of a help for vacation schedules, fill in for missing brains and hands, level the summer output slump."

Foote Mineral Co. (Philadelphia) considers its relations with part-time employees "a happy arrangement for all concerned."

Worth the Paper Work: Some companies complain that part-timers, particularly summer help, just get to learn their jobs when they have to leave. At least one company, Pennsylvania Salt Mfg. Co. (Philadelphia), lists this as one of its reasons for not having any interim help at all. LeBaron comments, "We prefer as long a tenure as possible—a full three months is ideal. We won't go below two months, as it isn't worth the paper work."

Weekend or holiday help, it's sometimes averred, is more trouble than it's worth, poses problems in accident liability, etc. But weekenders can be useful; National Aluminate, for example, uses them to tend lab setups that must operate 24 hours/day, weekends included.

Teachers, Too: College students make up the bulk of the part-timers, although high school teachers and college professors are finding this kind of employment steadily more attractive.

In its summer program, California Research Corp. (subsidiary of California Standard Oil) uses college students (juniors through postdoctoral) to work in chemistry, physics, engineering, etc.; high school teachers (generally selected from schools nearby) for physical science and mathematics; and college professors (chemistry or chemical engineering) from any recognized college or university in the country.

But few part-time hiring programs are this elaborate. Morton Salt Co. (Chicago), for instance, says it will have one student, possibly two, in its laboratories this summer.

High school teachers are currently among the most sought-after part-timers. The American Chemical Society's Chicago section started a recruiting program for high school teachers last year, placed a few. This year, however, over 150 teachers have reportedly asked for part-time employment. There's one restriction: companies can't hire the teachers permanently. Under the ACS program, firms must agree not to offer full-time jobs at the end of the summer.

High school students are a relatively unexplored pool of part-time workers. At the University of California (Berkeley), high school students were recently tried as assistants in the biochemistry and physiological chemistry departments. Results were encouraging to both the students and the university.

Limited Goals: Part-timers generally handle analytical or other routine research work—jobs that take limited experience. At California Research, assignments for part-time employees are carefully selected so that the latter may accomplish a definite part of a research project during the limited time available. Most companies expect part-timers to provide only extra manpower on projects—as needed, and under tight supervision.

Part-timers not only score well with management, but also are found to have the approval of regular employees—the regulars appreciate a lift during the summer. LeBaron declares: "If a part-timer is resented, we don't rehire him. But we've been fortunate and I'd say that over 90% of them have pitched in and done a darn good job."

The Payoff: Rates of pay and method of payment vary, depending on the individual's job, background, experience, etc. Nalco pays college undergraduates (like Wallace) $250/month the first year, $275 the next, $300 the next. Laboratory Manager E. C. Crocker candidly admits, "We

Man with Opinions

STAUFFER'S HOBART THOMAS, assistant to the vice-president, research, has had ample opportunity to form opinions of the value of part-time researchers. Thomas says: "Part-time workers do a good job. They require the close supervision of our regular help, but our program is set up to utilize them to best advantage. It doesn't take them long to mesh into our operation."

Stauffer hired part-time people before there was any talk of a shortage of researchers, and even when there was a surplus.

The company now employs students for part-time work during the entire year and college teachers during the summer. This summer, for the first time, Stauffer will hire high school teachers, bringing the total of part-time employees at the firm's Richmond, Calif., laboratories to 6 or 8.

Students who work during the school term are paid on an hourly basis. But during the summer they are paid on the same regular basis as other employees, collecting a paycheck twice a month. Like Stauffer's other West Coast laboratories, the Richmond laboratory hires only engineering and chemistry students and teachers for interim duties.

Thomas reports that Stauffer's regular employees are happy to have the part-timers in the laboratory—especially during the summer when the staff is normally depleted by vacations.

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try to get them to return each summer."

Other companies pay on an hourly basis equivalent to what the part-timer would be making as a permanent employee. Hourly payment is claimed to be more convenient.

Not all the rewards to the employee are monetary. Students earn a chance to learn what's going on in industry, find out the kinds of jobs available to them after graduation. They get practical experience in research, acquire information about a specific company, receive a measure of guidance in their chosen careers.

A Trend: Most companies agree that the hiring of part-time researchers will increase in the chemical industry. Crocker expects National Aluminate's part-time hiring program to continue if only because of its vacation-easing aspects. Nalco, moreover, has started hiring high school and junior college teachers, expects to expand this portion of its interim hiring.

Another favorable note for the future is sounded by International Minerals' LeBaron. "We'll keep it up as long as business conditions are good, regardless of the manpower supply situation. And we'd take a long look at it before abandoning the idea, even if business were bad—which I don't feel will happen."

And for the long range, Dearborn's Wilkes adds: "Personally, I feel that the more we realize how much we can extend the usefulness of our own researchers this way, the more valuable we will find part-time researchers."

Firms planning to hire part-timers for the first time can take a leaf from the book of their more experienced counterparts. Most of the latter agree that the most important thing to remember about interim employees is that tact and understanding are required in their supervision.

One large Eastern chemical producer reports that one of its most talented part-timers is a housewife who has mastered a useful technical specialty. Others range from chemistry professors retained as consultants, to undergraduates whose principal merit is a willingness to work. But given the right projects—commensurate with their training, ambitions and capabilities—part-timers are generally proving to be an investment that's paying good returns.

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New York University's Paul Gross sees ribonucleoprotein (spherical particles, right) as a key to cell gelation.

New Clue to Cancer

The mechanism by which living cells divide is still largely a biological mystery. But one fact is known: before cells divide, their cytoplasm thickens. Cancer researchers have long sought to learn how this property may be used to inhibit malignant growth. This week, a team of New York University biochemists, headed by the assistant professor of biology, Paul Gross, can point to two new achievements that may bring this objective closer.

Using animal cells, Gross and his colleagues have:

- Identified the part of the cell apparently responsible for gelation. It's a ribonucleoprotein measuring 1½ microns in diameter.
- Proved a direct connection between several precell-division occurrences previously thought to be unrelated. These include gelation, a sharp increase in oxygen consumption by the cell, and a release of acid.

So far, the NYU team has conducted only test-tube gelation studies of normal cells. But they plan to probe tumorous cells, too.

Changing the Charge: Gelation is the clustering of cell molecules as a result of a change in their electrical charge. When Gross changed the ionic environment by removing electrically charged calcium from the cytoplasm, he discovered that gelation did not occur. Gross does not believe that the calcium ion directly triggers the gelation reaction; rather, he believes that it activates an enzyme that does the job.

Lack of information about the details of the gelation process has been one big hurdle to progress in cancer chemistry. Gross's discovery of the gelation-causing nucleoprotein has reduced the barrier. Now, researchers are faced with the task of integrating their new information into the accumulation of cancer research data.

DRUGS . . . . . .

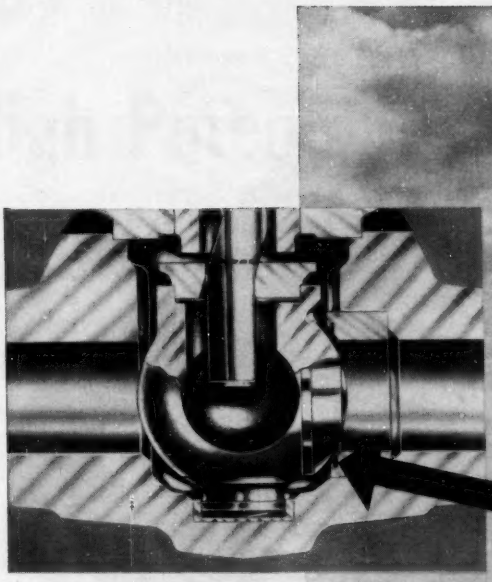
- According to Smith, Kline & French (Philadelphia), 5,5 diphenyltetrahydroglyoxaline-4-one (SKF No. 2599) is a new anticonvulsant that's safer than currently used diphenylhydantoin.
- At Wyeth Institute for Medical Research (Philadelphia), about 50 phenylhexamethyleneimine derivatives were recently synthesized, assayed for analgesic potency. One of the group, 4-propionoxy-1,3-dimethyl-4-phenylhexamethyleneimine, is said to be almost as active as morphine.
- Another compound that has reportedly shown powerful analgesic effects in recent laboratory tests is Hoffmann-LaRoche's (Nutley, N.J.) 1-methyl-3-allyl-4-phenyl-4-propionoxypiperidine hydrochloride (RO-2-7113).
- Parke, Davis & Co. (Detroit) reports that ethyl (2,2,2-trichloro-1-hydroxyethyl carbamate) is equal to chloral hydrate in potency, onset and duration of sedative and hypnotic effects when given orally to rats.
- Analogs of thyoxine (the thyroid hormone) have recently been synthesized and studied for biological activity at the University of Wisconsin's (Madison) Institute for Enzyme Research and Dept. of Biochemistry. Most active: [3,5-diiodo-4-(3′-iodo-4′-hydroxyphenoxy) phenethylamine].
- A new intravenous anesthetic, Methitural [5-(2′-methylthioethyl)-5-(1-methylbutyl)-2-thiobarbituric acid], developed by Schering Corp. (Bloomfield, N.J.), is said to be significantly shorter-acting than thiopental (a barbiturate), based on equivalent anesthetic doses.

EXPANSION . . . .

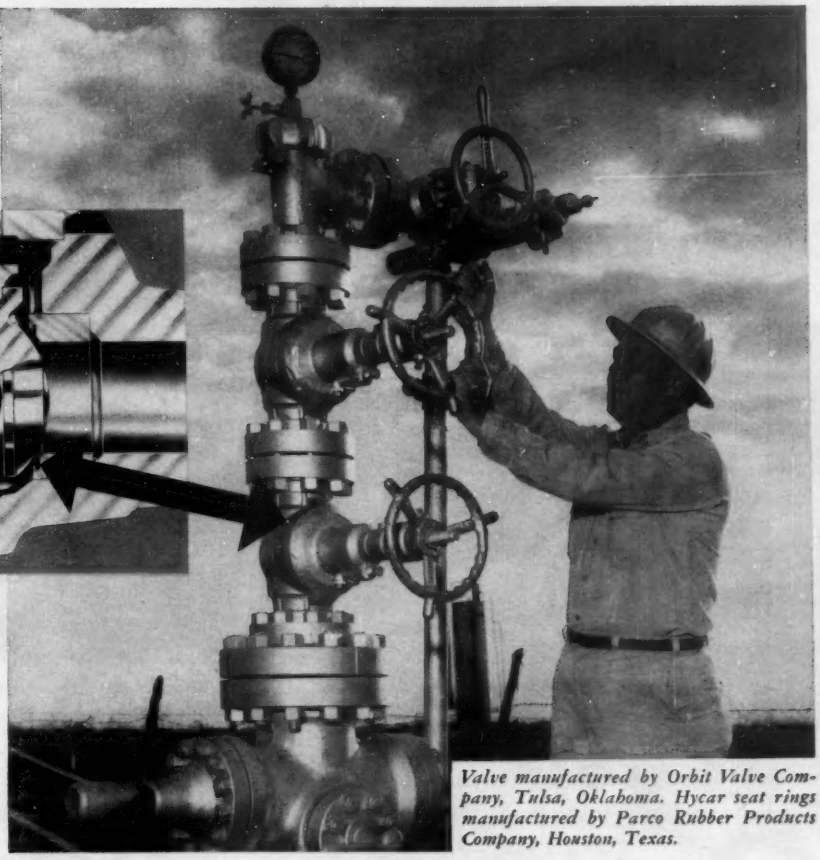
- Shell Oil has officially opened its new laboratory building in Houston, Tex. It's to be occupied by Shell Oil's technical services division and elements of Shell Development's exploration and production research division.
- Sylvania Electric Products has established a microwave physics laboratory at Mountain View, Calif., for research in magnetic ferrites, gaseous electronics, etc.
- A $1-million research center is planned by Consolidated Paper Co. for Grand'Mere, Que. Construction is scheduled to start this year.
- Dominion Rubber Co. (Montreal) reports it will soon start construction of a project that will quadruple the laboratory space of its Naugatuck Chemicals Division at Elmira, Ont. Completion is expected by December.

Another new development using

B. F. Goodrich Chemical *raw materials*



Arrow indicates location of valve seat ring made of Hycar. Flow pressure is from left to right.



Valve manufactured by Orbit Valve Company, Tulsa, Oklahoma. Hycar seat rings manufactured by Parco Rubber Products Company, Houston, Texas.

HYCAR VALVE PUTS THE SQUEEZE ON LEAKS

WHEN high pressure looks for a way out of the gate valves on this Christmas tree, a pin scratch can become a gusher. But not here—for the valves have seat rings made from Hycar rubber.

Where a leak might start from a scratch or corroded spot, the upstream line pressure forces the Hycar ring tight against the valve core, filling in any weak spots in the metal-to-metal seal. Hycar successfully resists the ravages of crude oil, salt water, gas and gas distillate. Its tough surface shrugs off abrasive particles scraping through valves at high pressure.

The unusual properties of Hycar American rubber have made it a versatile worker in the gas and oil industries. It lives side-by-side with hydrocarbons that destroy other types of rubber—keeps its exceptional strength, resists shock and vibration and is flexible at high and low temperatures.

These and other properties of Hycar have helped engineers in many industries solve unique material requirements. Perhaps we can help you put it to work on one of your design problems. For further information about these and other applications, please write Dept. S-6, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland 15, O. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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High Potential Chemicals Released for Full Commercial Development by New Celanese Aldol Production

Is there an organic chemical that's "perfect" for your processing but wrong in volume, purity, or price?

For polyurethane and alkyd resin producers, trimethylolpropane was such a material. They were sold on its superior properties but the price was too high; the supply limited. Celanese Aldol Production is changing the picture for trimethylolpropane and other chemicals shut off by similar obstacles.

Celanese aldoling is unique. Several aldol units have been combined into one compact installation. Specially developed processes are employed. Production depends only on Celanese-produced aldehydes.

Result: trimethylolpropane in continuous commercial quantities to satisfy every demand . . . in unsurpassed uniform purity . . . and at a price that makes it competitive in all applications. Methyl isopropenyl ketone and 3-methoxy butanol are other Celanese Aldol Products already available in volume. Additional chemicals are in the development stage.

If you would like complete information about Celanese Aldol Products—or if you have a special chemical need that Celanese Aldol Production may be able to fill—mail coupon or write to Celanese Corporation of America, Chemical Division, Dept. 752-E, 180 Madison Avenue, New York 16.

Celanese® CHEMICALS

Celanese Aldol Products

On Stream

Trimethylolpropane
3-Methoxy Butanol
Methyl Isopropenyl Ketone

In Development

Anhydro Enneaheptitol
1, 3-Butylene Glycol (aldol grade)

Celanese Corporation of America
Chemical Division, Dept. 752-E,
180 Madison Avenue, New York 16.

Send me technical and price data on the following Celanese Aldol Products:

☐ Trimethylolpropane ☐ 3-Methoxy Butanol
☐ Methyl Isopropenyl Ketone

NAME_____ TITLE_____

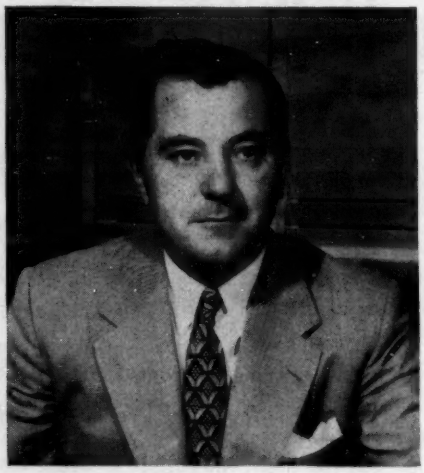
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

There's more than one road to sales management . . .

◀ **FORMER PURCHASING AGENT** Smitskamp becomes general sales manager for Armour biochemicals.



FORMER LAWYER Smith assumes general manager position for Pfizer chemical sales division.

◀ **FORMER RESEARCH MAN** Wilson steps into sales as manager of Commercial Solvents' pharmaceutical chemical division.

Executive Ability Is Where You Find It

Executive talent for sales and distribution is where you find it.

And that, as such recent moves at Armour, Pfizer, Monsanto, Commercial Solvents and Eagle-Picher indicate, can be in many places besides sales—in purchasing, law, research, or almost any other department.

Monsanto transferred its general manufacturing superintendent, William McCracken, to technical service duties with Mobay Chemical, and Eagle-Picher moved John Clark from sales to sales-service and paint research.

Superficially, such moves mean that it's getting harder to tell where a sales executive cut his teeth. More significantly, however, the shuffling is clear evidence that experience acquired in one department can be an excellent base for service in others.

Purchasing to Sales: "Different sides of the same coin," is the way Armour Laboratories' Gary Smitskamp describes sales and purchasing. "In each case, you try to get the other fellow to do what you want him to do. Honesty, integrity and straightforwardness are important in both fields. Purchasing agents, too, sell every day. They sell their company's philosophy, they sell themselves and their ideas.

Smitskamp's eight years of purchasing for Armour included an offbeat type of selling. To buy animal glands, he had to travel in all 48 states, "sell" meatpackers on saving glands for chemical processing. This meant competing with other bidders, proving the profit potential to packing houses, and even getting plant labor to "save every pituitary."

You'd move slowly, too...

If you carried 97.8% LIMESTONE on your back!

It's true — our friend *"Speedy" The Snail's* house misses being pure calcium carbonate by just 2.2%.

But along the Norfolk and Western there are vast deposits of limestone that are even more pure — in fact, more than 97.8% calcium carbonate.

Some of these deposits are in mineable thicknesses of 100-foot veins, and in one location alone it is estimated that the deposit exceeds 100 million tons. Seldom has so much high quality limestone been so accessible for cement and chemical lime manufacturers — with markets nearby and dependable N&W transportation available.

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And here are typical analyses*

	DNL-1-1	DNL-1-2	DNL-1-3
SILICA (SiO_2)	.36%	.30%	.34%
IRON OXIDE (Fe_2O_3)	.072	.043	.049
ALUMINA (Al_2O_3)	.21	.20	.19
LIME (CaO)	55.00	54.90	55.40
MAGNESIA (MgO)	.65	.62	.51
SULPHUR (S)	.012	.011	.015
PHOSPHORUS (P)	.006	.006	.009
IGNITION LOSS	43.20	43.50	43.20
CALCIUM CARBONATE (Calculated)	97.90	97.72	98.51
MAGNESIUM CARBONATE (Calculated)	1.36	1.30	1.07

***Report prepared by Pittsburgh Testing Laboratories, Pittsburgh, Pa.**

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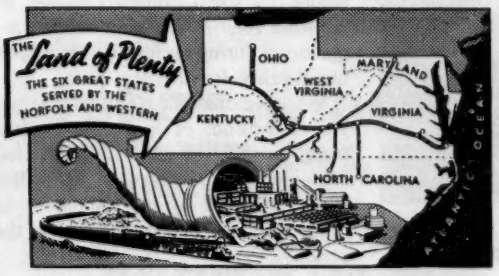

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. . . but production jumped 40% overnight, after a Barnebey-Cheney Automatic Solvent Recovery System was put in operation. Before, this plant was plagued by air pollution in work areas. Most employees could work no more than half a day at the most. Barnebey-Cheney system not only made the plant habitable but recovered enough solvents for re-use to pay for itself in a short time.

Get the full story on how it's done. Write for the free bulletin: "Solvent Recovery Actually Takes Dollars Out of the Air."

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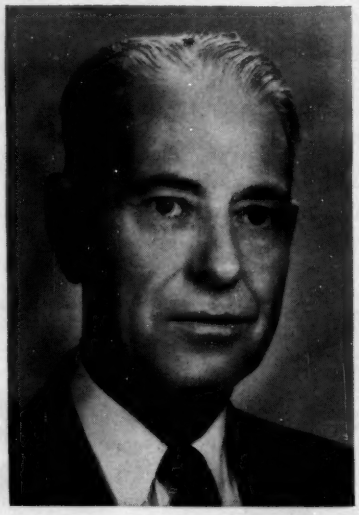
"Most valuable experience" to a sales manager, feels Smitskamp, "is a combination of technical background, production experience and purchasing know-how." From purchasing specifically, the most valuable lesson learned, he says, is dependability. In building sales, former purchasing agent Smitskamp plans to stress this seven-point code to his force:

1 Identify yourself.
2 Know your limitations.
3 Know your products.
4 Know your purchasing agents.
5 Know your company and its services.
6 Know your competition.
7 Get the order.

Reverse Twist: The purchasing-to-sales transition has a reverse counterpart. Pitman-Moore switched its regional sales manager, Lester Davis, to chemical procurement. Speaking from a background of over 18 years in sales and over one year in purchasing, Davis finds his sales experience most useful in:

- Ability to quickly recognize a salesman's pitch for what it is.
- Understanding of the hardships salesmen encounter. Such practices as "immediately advising salesmen if the wait for an interview will be more than 15 minutes" lead to good relations.
- Ability to spot the features of a salesman's product that are most useful to the firm.

Both Davis and Smitskamp agree that the sales or purchasing executive can profit handsomely from experience gained "on the other side of the fence."



FORMER SALES MANAGER Davis now buys materials for Pitman-Moore.

Legal to Sales: Although Pfizer's J. Philip Smith received permanent general manager (sales) status recently, he switched from production to law then, five years ago, to sales, when he acted as legal liaison between Pfizer and federal agencies. Subsequent positions smoothed the transition.

The legal training proved to be a big asset in his sales career. A corporate lawyer, he points out, is "constantly delving into company business, policy, contracts, and generally mixing with every branch of the firm." One drawback: the legally trained sales manager must be wary of a tendency to reason in terms of precedent—so much a factor in law.

Research to Sales: Before becoming Commercial Solvents' manager of the pharmaceutical chemical division (essentially a sales management position) last week, Harry M. Wilson, Jr., had only limited contact with sales operations. To an earlier background in research, Wilson added five years of experience as administrative assistant to the vice-president in charge of research, who also switched, became vice-president in charge of the biochemicals division.

Why a research man for sales? To sell antibiotics at the bulk level to established pharmaceutical houses, the company needs a sales manager thoroughly familiar with pharmaceutical technology. Its products often must be modified to meet the formulations of customers. And a research man is the one most likely to know what can be done, how, and what it will cost.

Other Shuffles: Clark's change at Eagle-Picher from sales to paint research and technical service supervision has this aim: encouragement of sales-minded technical service.

On the other hand, Monsanto's transfer of production man McCrackin to technical service at Mobay was intended to speed commercial use of urethane foams. Customer service assignments during his long career helped him qualify for the new post.

Sales personnel needn't fear a large-scale invasion of promotable talent from nonsales departments. The cited examples are rather special cases. But when the need arises, the talent in other departments is there for the seeking.

Have you tried MICRO-CEL®

- to absorb liquids
- to provide bulk
- to prevent caking
- to control viscosity
- to extend pigments
- to aid suspension
- to reduce surface sheen

The Powder That Flows Like a Liquid—Micro-Cel, latest development of Johns-Manville Research, will greatly improve the flowability of many products.

New Johns-Manville mineral filler can help you improve products and cut costs

WANT to absorb liquids or control viscosity? Try *Micro-Cel*—it absorbs up to 6 times its weight in water, remains a free-flowing powder even after absorbing twice its weight in liquids.

Want to bulk up your compound for better control of package density? Try *Micro-Cel*—a cubic foot weighs as little as 5 pounds.

Want to prevent caking? Try *Micro-Cel*—its high absorption works wonders in controlling deliquescent products.

Want to extend pigments or reduce surface sheen? Try *Micro-Cel*—it combines fine particle size, large surface area and inertness with high absorption suggesting many applications.

Want to assure better suspension of heavy solids? Try *Micro-Cel*—its particle size, as low as .02 micron, provides uniform dispersion and blending.

Micro-Cel is a brand-new line of synthetic calcium silicates produced by combining lime with diatomaceous silica under carefully controlled conditions. Its unique combination of properties has already brought important benefits and savings to many processors. Maybe you will be next. Just mail coupon for further information, samples and technical assistance.

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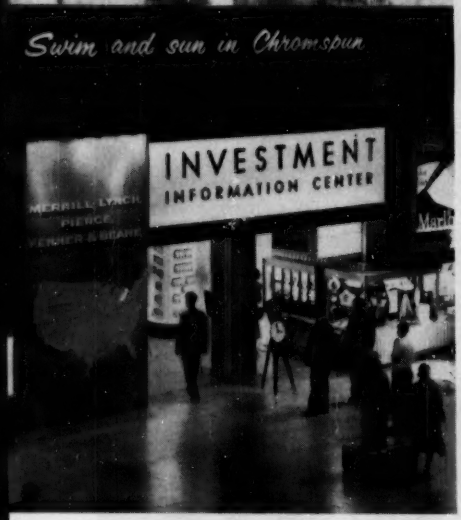

IN GRAND CENTRAL TERMINAL: Allied's information center puts . . .

Public Relations on a Fast Track

It's not too unusual for a brokerage house to evince interest in a chemical company, but going on right now in New York's Grand Central Terminal is an alliance that may well set a pattern. Merrill Lynch, Pierce, Fenner and Beane (broker in stocks, bonds and securities) is leasing space in the terminal's grand concourse and renting it out for exhibits.

Exhibitor for this month and next: Allied Chemical & Dye.

Arrangements are that Allied and Merrill Lynch will share space (and costs) for the two-month period, and the deal appears to be mutually profitable.

The chemical company's rental will come to something over $5,000, while display material cost is less than $10,000. The total, as far as Allied is concerned, is well spent, considering the interest that has been created in its products.

Some 6-8,000 people visit the exhibit each day, which helps further the company's objective of establishing the name of Allied and its divisions in the public's mind. At present, the demonstration, featuring the wide variety of products (polyurethane foam and melamine dinnerware, for example) made with Allied raw materials, runs to 130 shows a week, each lasting about 10 minutes, followed by a five-minute question-and-answer period.

The type of audience attracted by the display, as indicated by the questions asked, is desirable—businessmen, for the most part.

Sample queries: Has polyurethane been tried as a cigarette filter? Can it be used to line raincoats and overshoes? Would it be suitable as packing material for expensive camera equipment?

Responsible Majority: And Allied isn't missing any bets in its probe for such possibly money-making ideas. Cards are available at the demonstrations for those wanting a technical representative to call and supply further information. To date, some 500 cards have been filled out, the majority by men holding responsible business positions. The response is a clear indication to the chemical seller that this is more than just idle curiosity.

Literature available at the exhibition includes reprints of an Allied ad, booklets on Barrett Division's roofing products, a leaflet on Caprolan, the company's new nylon. Also available: a pamphlet (especially prepared for the show) on polyurethanes, and a pocket-size pamphlet, "Introducing Allied Chemical."

For the more financial-minded viewer, the company will send copies of its annual reports, if a prepaid postcard is filled out. Some 200 of these

Tiny chemical "shingles" of **AERO*** Stearate make waterproofing concrete simple and economical

AERO Zinc Stearate forms very small, shingle-like plates that are extremely resistant to wetting. They give large contact angles against water, causing it to be drawn up into drops on a concrete surface as shown above (left). Untreated surface (right) absorbs water.

AERO Aluminum and Calcium Stearates, while differing in particle shape and size, solubility and dispersing characteristics, also make effective waterproofing agents for cement and many other applications.

Only small quantities of AERO Stearates are needed to waterproof concrete. They may be added to the cement clinker before grinding, to the concrete mix at time of hydration, to cement water paints or used in spray form for coating concrete surfaces.

AERO Stearates also are widely used as dry lubricants, in powder metallurgy and ceramics. Aluminum Stearates offer good gelling properties for compounding greases.

Whatever the application, you can rely on AERO Stearates to give consistent, reproducible results based on the exceptional uniformity described in our Typical Analysis Sheets. Write for your copy.

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For dispersing

- wettable insecticides
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use POLYFON sodium lignosulfonates, low-cost derivatives of plentiful pine wood lignin. These agents have great versatility, are applicable in many fields, some of which are indicated above.

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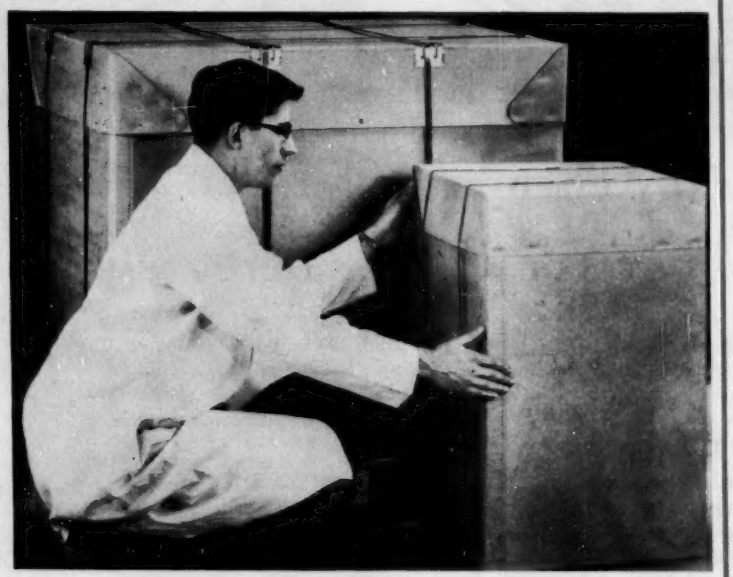
SALES

postcards have already been distributed.

After this week, Barrett's Genetron aerosol propellents will be featured; a demonstration of melamine resins is scheduled for June, to coincide with the plastics show in New York's Coliseum.

DATA DIGEST

- **Plastic resistance:** Booklet gives data on resistance of structural reinforced plastics to 66 chemicals. Denham & Co. (Detroit).
- **Silicone rubber:** 8-p. bulletin supplies specifications, data and chemical resistance of silicone rubber and coated cloths. Raybestos-Manhattan, Inc. (Manheim, Pa.)
- **Iodine:** 70-p. book tabulates physical constants and description of iodoso, iodoxy, iodonium and iodyl compounds, and gives bibliographic references. This publication is based on a comprehensive survey of the literature through 1952. Chilean Iodine Educational Bureau (New York City).
- **Injection molding:** 51-p. brochure describes techniques of injection molding of acetate and butyrate plastics. A "trouble-shooter's" guide is also included. Eastman Chemical Products, Inc. (Kingsport, Tenn.).
- **Hexamethylenetetramine:** Booklet gives chemical and physical properties, suggests uses as a rubber accelerator, solid fuel, urinary antiseptic, an intermediate, and as a deactivator for carriers in insecticide formulation. Heyden Chemical Corp. (New York City).
- **Brittle resins:** Brochure provides description and typical properties of resorcinol-formaldehyde resins for adhesives, where rapid or low-temperature curing is desired. Chemical Division, Koppers Co. (Pittsburgh).
- **Acrylamide:** Brochure furnishes



'Junior' Joins the Haul

LATEST CONTESTANT in the struggle for sales in the bulk container field is this midget-size corrugated box offered by Crown Zellerbach's Gaylord Container Division. Similar to a larger version (in background), the new unit can hold up to 200 lbs., measures 20½ x 20½ x 30⅞ in. and can be knocked down for shipment when empty. Steel strapping secures the container against accidental opening, and it's claimed that handling requires neither pallets nor skids.

IGEPAL® CO-630

is in a class by itself!

TWENTY YEARS of continuous research by the leading manufacturer of nonionic surfactants, has culminated in this superior 100% active ingredient IGEPAL, which is *tops in performance* because it is *tops in quality*. Consider these new "plus" features:

- Water-White Appearance
- Noticeable Lack of Odor
- Non-Stratifying Liquid
- Sediment-Free

Igepal CO-630 is one of a series of 8 Igepal CO brands that range from the oil-soluble Igepal CO-430 to the extremely hydrophylic Igepal CO- 880. A new booklet has been prepared giving complete technical data on this important group of surfactants. Send for it today.

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Tomorrow's "tomorrows" are already part of everything we do and make. And what we know . . . or are learning . . . we are ready to share among all users and potential users of Oldbury products.

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The Chemstrand Corporation, Decatur, Ala. This plant has an annual capacity of 30 million pounds of Acrilan, a new synthetic fiber of the acrylic type. Their "Research Center" is the four buildings at the left, the front three buildings being laboratories, and the rear one the pilot plant. The plant office building is near the center, with the manufacturing facilities and boiler plant at the right.

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OVER A CENTURY OF INDUSTRIAL PLANT DESIGN EXPERIENCE

data on physical and chemical properties, suggests applications as an intermediate and monomer. American Cyanamid Co. (New York).

• **Investment casting:** 40-p. brochure provides design information and data on representative physical, chemical and mechanical properties of 26 investment casting alloys. Haynes Stellite Co. (New York).

• **Antibiotic feed supplement:** Bulletin describes the characteristics and the value of bacitracin-base feed supplements. Commercial Solvents Corp. (New York).

• **Paraformaldehyde:** Booklet outlines physical and chemical properties, describes applications in synthetic resins, formaldehyde production, bactericides, fungicides, photography, embalming, and paper and starch preservation. Heyden Chemical Corp. (New York).

• **Rare chemicals:** Revised listings and prices of unusual chemicals that indicate the type of rare chemicals that the company can supply. Chemical Procurement Co. (New York).

• **N-substituted morpholines:** 4-p. data sheet gives chemical structure, physical and physiological properties, and bibliography for N-methyl, N-ethyl, N-phenyl, and N-(3-aminopropyl) morpholine. Application is suggested as a solvent, catalyst in polyurethane foams, styrene distillation, polyamide fibers, dyeing, and corrosion inhibition. Carbide and Carbon Chemicals Corp. (New York).

• **Metal chemicals:** 8-p. booklet delineates a selection of molybdenum, uranium, vanadium, and tungsten chemicals. Millmaster Chemical Corp. (New York).

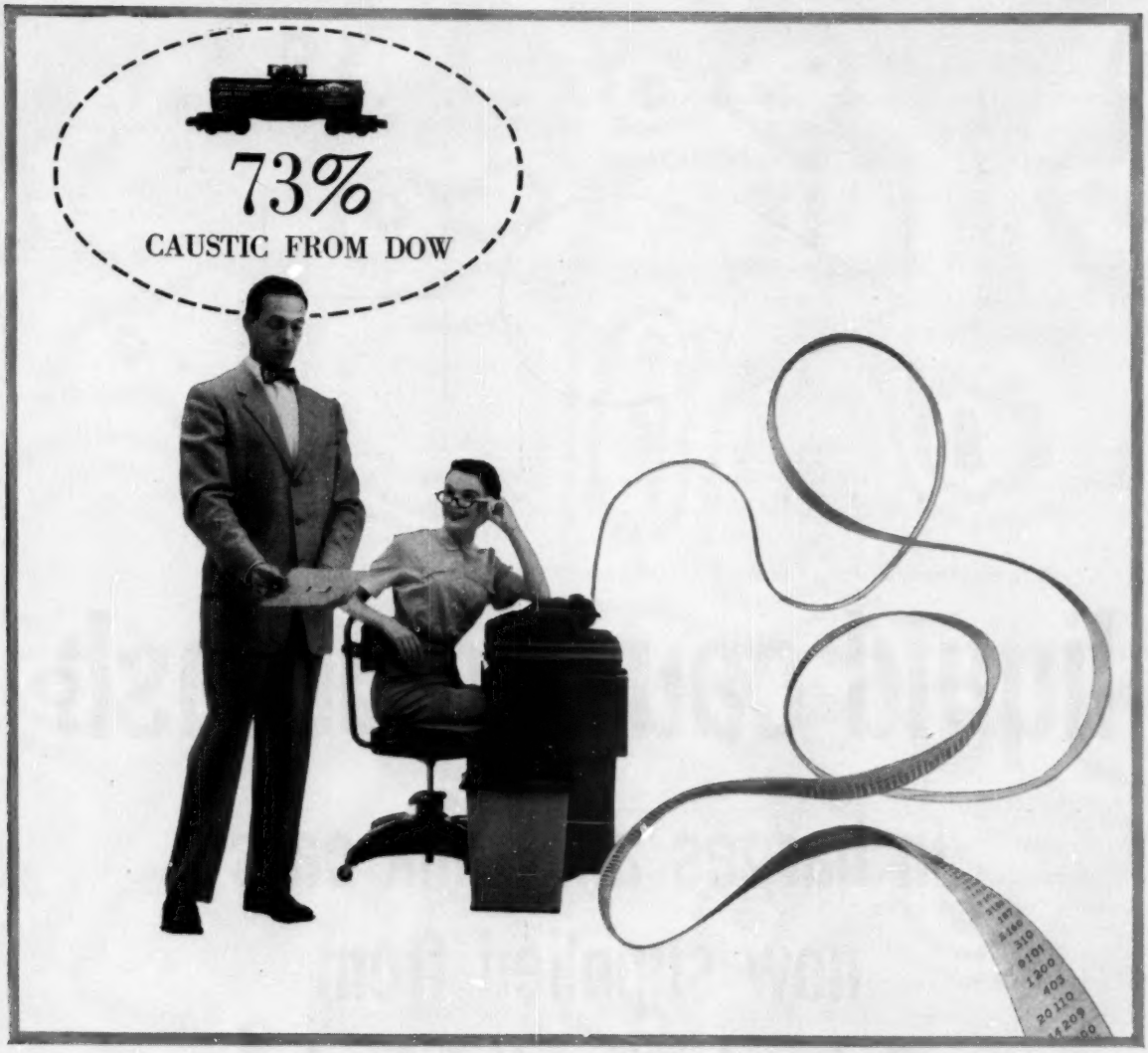
• **Safety data:** Data sheets for arsenic trioxide (SD-60) and phthalic anhydride (SD-61) offer information on the safe handling, storage, waste disposal, and use of the chemicals. 30¢, Manufacturing Chemists' Assn., Washington, D.C.

• **Soil fumigants:** Bulletin supplies information on the use of ethylene dibromide fumigant in nematode-infested land. Agricultural Chemicals Division, American Potash & Chemical Corp. (Los Angeles).

• **Canadian shipments:** Guide supplies tips on preparing shipments to Canada and uses of import and export documents. Consolidated Freightways, Department GSD (Portland, Ore.).

THIS MAN IS MAKING
HIS REPUTATION . . .

DOW



HAVE YOU CHECKED THE SAVINGS YOU MIGHT GET WITH 73%?

The gentleman above has just been struck by an idea. It may very well save his company an appreciable amount of money. The thought: Dow caustic soda in 73% solution is probably *his* best buy, too.

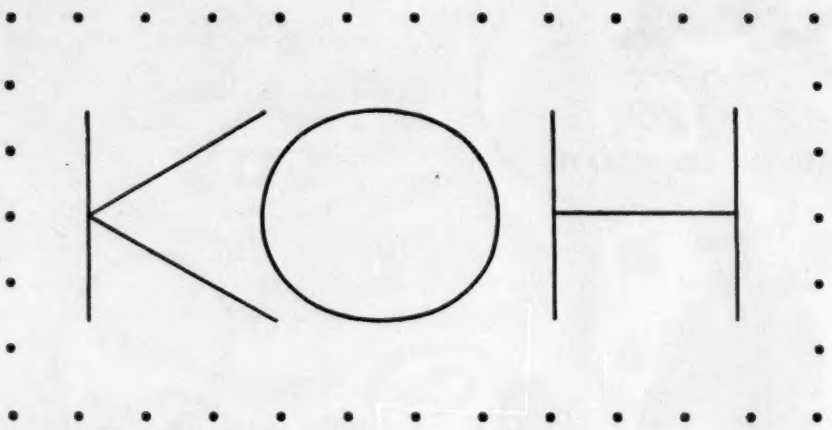
If someone in *your* organization hasn't checked the changed caustic picture lately, you may be missing this chance to save. Hundreds of caustic users *have* discovered the new economy of Dow's 73%. Why an economy? Because today's *increased freight rates* more than cancel out the narrow price difference between 50% and 73%.

A second point of savings, particularly for greater volume users, is the *unloading operation.* Many man-hours are saved because 73% unloads in the same amount of time as a car containing a lower concentration.

A Dow Technical Service man can give you an accurate picture of the savings you could realize with 73%. And don't rule out 73% even if you're now on solid or flake. The pertinent; factual information you get so easily is one of the advantages of dealing with Dow. THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. AL 392B-2.

you can depend on DOW CHEMICALS DOW

New from Pennsalt:



liquid caustic potash

in barges and tank cars now supplied from Calvert City, Kentucky

New Pennsalt facilities at Calvert City, Kentucky, are now producing high-purity caustic potash for shipment in tank cars or barges to users of standard and low-chloride grades. Call your nearest Pennsalt district office for full information.

Pennsalt Chemicals

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PENNSYLVANIA SALT MANUFACTURING COMPANY

Outlook for acetylene, as for the chemical industry in general (*see p. 98*), is brushed with optimism. Consumption in chemical outlets, for example, will hit some 840 million lbs. in 1961—a 77% increase over this year's estimate of 475 million. This, commented Carbide and Carbon's R. J. Musser at this week's CMRA meet in New York, is equivalent to a growth rate of about 12% a year.

Likely to take a lot more acetylene in the near future: acrylonitrile, vinyl acetate, acrylates, high-pressure acetylene chemicals, vinyl esters, and vinyl ethers. Supplies of acetylene from calcium carbide and hydrocarbon sources, believes Musser, can be readily expanded to meet the demand.

•

Resale prices on sodium silicofluoride appear to be easing, with the material reportedly being more freely offered at 9½¢/lb. The continuing world-wide shortage of fluorides, however, is setting back some water fluoridation plans. Cleveland, for one, is delaying treatment of its water supply, scheduled for June 1, although installation of $116,000 worth of equipment at three filtration plants is just about completed.

Reports are that four chemical companies couldn't supply the 900 tons of fluoride needed. A fifth said it could get 300 tons, but that would have to be shipped from Denmark or Holland. Cleveland turned down the offer.

•

The Navy's interest in plastic boats has expanded to include whaleboats.

Worth well over a quarter-million dollars, a Navy order for 28 whaleboats—each 26 ft. long—has gone to Wizard Boats (California). The plastic craft's selling points: ease of repairs, and resistance to weather, water rot, fungus attack.

The Navy's first interest in plastic vessels resulted in contracts for polyester landing craft (*CW, May 19, p. 157*).

•

Following a brief respite, paintmakers are again paying higher prices for lead chemicals. Early this year (*CW Market Newsletter, Jan. 21*), tags on several lead items were dropped ½¢/lb., are now being boosted to the previous levels by a leading producer.

Incidentally, this is the first time in 3½ years that lead chemical price changes haven't been related to corresponding changes for pig lead; these latest changes are attributed only to increased production costs.

New prices for 95% red lead: 19¢/lb. c.l., and 20¢/lb. l.c.l., up ½¢ and 1¢, respectively. Similar increases apply to other grades of red lead.

The same per-pound increases move litharge tabs to 18¢/lb. in c.l. quantities, 19¢/lb. l.c.l.; orange mineral is hiked from 20.6¢ to 22.6¢/lb. in carlots.

•

But there's a price reduction for polio vaccine. Improved manufactur-

ing methods (*CW, May 19, p. 142*)—reports Parke, Davis—permit a 10% price cut, which brings the cost of each 9 cc. vial down to $12 from the previous $13.34.

•

Aerosol sales in '55 were propelled to record highs, according to a survey just completed by the Chemical Specialties Manufacturers' Assn. A grand total of 240 million units were sold in the retail market for about $250 million, represent gains of 30% and 32%, respectively, over '54.

Insecticides kept their top-volume rating with the sale of 56 million units (23% of total). Running a close second, hair net spray sales hit 53.7 million units.

Room deodorants jumped most—86.7% higher than in '54—to 32.1 million units, but volumewise were still far behind shave lathers, which climbed 7.3% to 45.4 million units. Sale of household aerosol products (oven cleaners, waxes, insect repellents, etc.) totaled 6.2 million units, and aerosol fire extinguishers trailed with 1.9 million units.

Incidentally, there was substantial use of glass containers for aerosols in '55; some 10.4 million units were filled. In contrast, 257 million metal cans and 245 million valves were produced, though not necessarily all were filled in '55.

Liquid insecticides are becoming more popular. According to the CSMA survey, total sales in '55 were up 1.19% to 10,557,386 gal.; of this, more than 8.6 million gal. were packaged.

Use of chlordane and dieldrin in residual sprays shot up 46% over '54, to over 3.5 million gal. (These materials now go into 48% of all residual sprays.)

Fabric pest sprays were up 41% to 155,110 gal.; livestock emulsion sprays increased 70% to 221,715 gal.; fly baits—a relatively new type of product —were reported separately this year; sales were more than 3.8 million lbs.

Survey findings on brake fluids were both surprising and disturbing; 16.8% of the fluids produced in '55 (compared with 12% in '54) did not meet SAE or government specifications. Total production of moderate duty (SAE) fluid was nearly 2.85 million gal.; output of heavy-duty fluid was 5.68 million gal.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending May 21, 1956

UP

	Change	New Price
Candelilla wax, crude, bgs.	$ 0.03	$ 0.57
Capric acid, dms.	0.01	0.25
Carnauba wax, crude, N. Country, No. 2 crude, bgs., ton lots	0.06	0.80
Defluorinated phosphate, feed grade, bgs., c.l., works, ton	2.00	50.00
Lauric acid, 90%, dms.	0.01	0.365
Platinum, metal, works, oz.	6.00	103.00

All prices per pound unless quantity is stated.

CSC NITROPARAFFINS

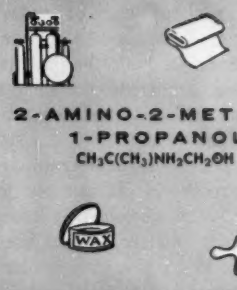
NITROMETHANE
CH_3NO_2

NITROETHANE
$CH_3CH_2NO_2$

1-NITROPROPANE
$CH_3CH_2CH_2NO_2$

IMPROVING PROCESSES AND PRODUCTS

2-NITROPROPANE
$CH_3CHNO_2CH_3$

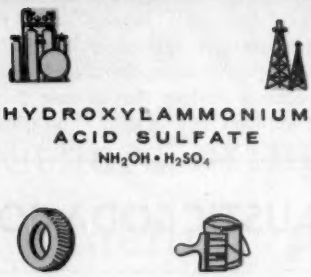


2-AMINO-2-METHYL-1-PROPANOL
$CH_3C(CH_3)NH_2CH_2OH$

TRIS (HYDROXYMETHYL) AMINOMETHANE
$(CH_2OH)_3CNH_2$

FOR AMERICA'S MAJOR INDUSTRIES

2-AMINO-2-METHYL-1, 3-PROPANEDIOL
$CH_2OHC(CH_3)NH_2CH_2OH$



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Nitroparaffins and their derivatives are economical, effective, versatile chemicals for such uses as solvents . . . prime ingredients . . . raw materials . . . sensitizers . . . emulsifiers . . . analytical reagents . . . reducing agents . . . inhibitors . . . short-stoppers . . . surface activants . . . dispersants . . . anti-foamants.

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CMRA Profiles the Industry's Future

Where is the chemical industry heading? Where has it been? Answers to these pertinent questions were forthcoming earlier this week, at the fact-packed spring meeting of the Chemical Market Research Assn. in New York's Biltmore Hotel. Theme of the two-day get-together: A Review and Forecast of the Chemical Industry.

Lead-off speaker in the roster of market experts at the Wednesday session, and outlining the government's views on sales, inventories, and expansions, was the Business & Defense Services Administration's Chemical and Rubber Division director, George Fowles.

Fowles scouted fears that the current downswing in some other industries will cut chemical sales. "Any such action", he said, "would be short-term only, and my translation of this year's capital outlays (up 40% over 1955) in terms of sales leads me to conclude that the chemical industry will top last year's record volume of $23 billion in sales."

Fowles also stated that he does not share the fears of some that the current "sidewise movement of chemical sales" and heavy expansion of capacity will result in excessive inventory and "subsequent recession."

Nitrogen Nadir? The nitrogen industry, as a whole, has expanded fast, now has a surfeit to cope with. But, insists Nitrogen Division's (Allied) Director of Research E. D. Crittenden, "for the long pull, the ammonia oversupply is a boon, is like money in the bank, or social security."

Reasons for Crittenden's optimism concerning perhaps one of today's softest commodities in the nation's marketplace tie in with the growing need for basic ammonia, not only in industry but also in fertilizer, the nitrogen's biggest outlet.

For example, he cited the continued expected growth in a number of comparatively new chemical uses such as acrylonitrile, melamine and urea. Add, too, the many new nitrogen-base materials (some for defense outlets), which are now in bench-scale developments, or in early-use trial.

On the agricultural front, Crittenden pointed out that it takes about 7 acres of land to feed a person, and with 2-3 million people being born each year, it becomes obvious that in time there just wouldn't be enough land on which to grow enough food for tomorrow's population. The solution, he said, is to grow more on land that is available, and this can be done with more fertilizer and other ag chemicals.

Chlorine, Caustic Rundown: Chlorine capacity—and consumption—in this country may well be headed for a doubling, although the rate of growth over the past quarter-century appears to be slowing. The rundown on chlorine production and use was presented by Hooker Electrochemical's general development manager, D. L. Taylor.

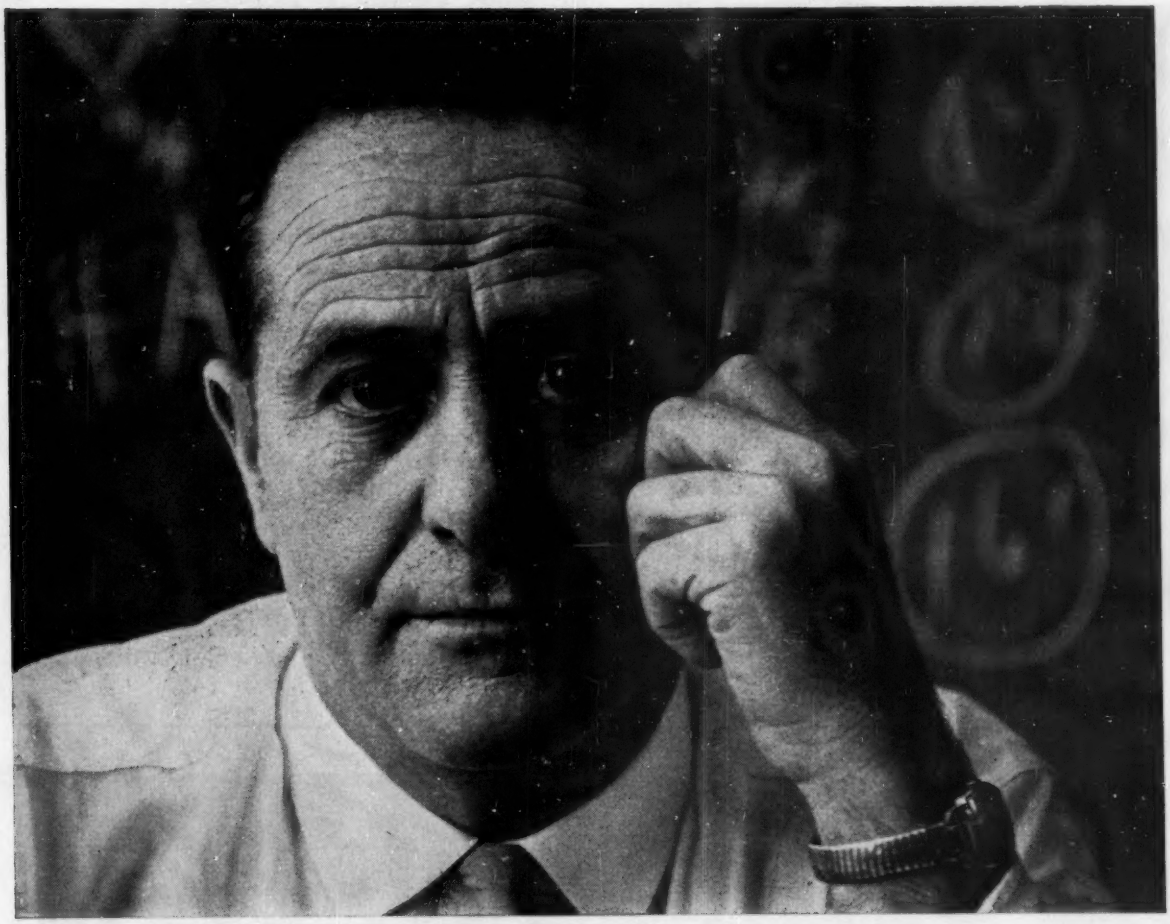
For some 25 years chlorine has grown on an average of about 12% a year. Since about 1950, however, this rate has dropped to 10%, and may fall off to some 8% in the next 5 years. Caustic's growth, though, has been a steadier 7%, and it's expected to maintain that rate for possibly 5-10 years.

At the moment, there are in the U.S. 37 chlorine producing companies and 35 making caustic, with total capacity running at about 11,000 tons/day of chlorine and 13,000 tons/day of caustic (including lime).

The current chlorine-caustic market picture, as far as the U.S. is concerned,

U. S. CHLORINE and CAUSTIC SODA CONSUMPTION in 1955

Chlorine			Caustic		
End-Uses	Tons/day	% of Total	End-Uses	Tons/day	% of Total
Pulp and paper	1,400	15	Chemicals	2,880	26.9
Chlorinated solvents	1,200	13	Rayon and film	1,900	17.8
Automotive fluids (TEL, other compounds)	1,000	11	Pulp and paper	710	6.6
Plastics and resins	1,000	11	Exports	620	5.9
Insecticides, herbicides	700	7.5	Petroleum refining	590	5.5
Refrigerants, propellents	480	5	Lye and cleansers	440	4.1
Water and sewage	320	3.5	Textiles	370	3.5
Others	3,240	34	Soap	220	2.1
Total	9,340	100	Reclaimed rubber	80	.7
			Vegetable oils	70	.6
			Others	2,820	26.3
			Total	10,700	100



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ANSUL GLYCOL DIETHERS	
121	Dimethyl Ether of Ethylene Glycol $CH_3OCH_2CH_2OCH_3$ (1, 2 Dimethoxy, Ethane)
141	Diethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_2OCH_3$
161	Triethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_3OCH_3$
181	Tetraethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_4CH_3$ (Dimethoxy Tetraethylene Glycol)
222	Ethylene Glycol Diethyl Ether $C_2H_5OCH_2CH_2OC_2H_5$

ANSUL

appears to be pretty much in balance, but Taylor doesn't discount the possibility of shortages—and overages—in a few localized areas. Over-all consumption of both products will continue to grow with pulp and paper and chemicals leading the list of end-use outlets (*see tables*).

Styrene Stretch: In the opinion of Monsanto's (Plastic Division) raw materials director, Richard Clark, demand for styrene, within five years, will reach nearly 1.5 billion lbs./year. Some 500 million lbs. of this would be required by S-type rubber (formerly GR-S under government aegis), with other end uses accounting for approximately 950 million lbs.

This level of consumption is a far cry from that prevailing about a quarter-century ago. In 1930, said Clark, styrene monomer and polymer were laboratory curiosities, but since then, the material has moved to a top rank among synthetic aromatic organic chemicals.

Demand for styrene monomer today and in the future, he declared, is backed by the rapidly expanding synthetic rubber industry, and is strongly supported by improved technology in the styrene polymer and copolymer fields.

Will there be enough available for future needs? Yes, believes Clark. And adds that "de-bottle-necking" and expansion of present producing plants and reports of new producers indicate that the capacity for styrene monomer and polymer will be adequate to meet the rapidly rising demand as it develops.

Tracking Upward: One future pattern of chemical industry growth will be traced by nuclear technology. That was an angle covered by L. F. Marek, vice-president and director of Arthur D. Little, Inc., in the kickoff talk of

Plastics Monomer Debut

MONOMETHYL STYRENE monomer bows into the plastics family as American Cyanamid's new $4.5-million, 40-million-lbs./year plant at Fortier, La. (*above*), gets into operation.

Part of the monomer will go into the making of polymethyl styrene, a heat-resistant molding plastic that will compete with regular polystyrene. The new plastic will probably be priced somewhere around 30¢/lb.

The monomer will also be copolymerized with acrylonitrile to yield other plastics (priced about 10¢/lb. higher) to compete with styrene-acrylonitrile polymers.

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Hydrofluoric Acid 70/75% and 48%
Potassium Titanium Fluoride
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Potassium Zirconium Fluoride
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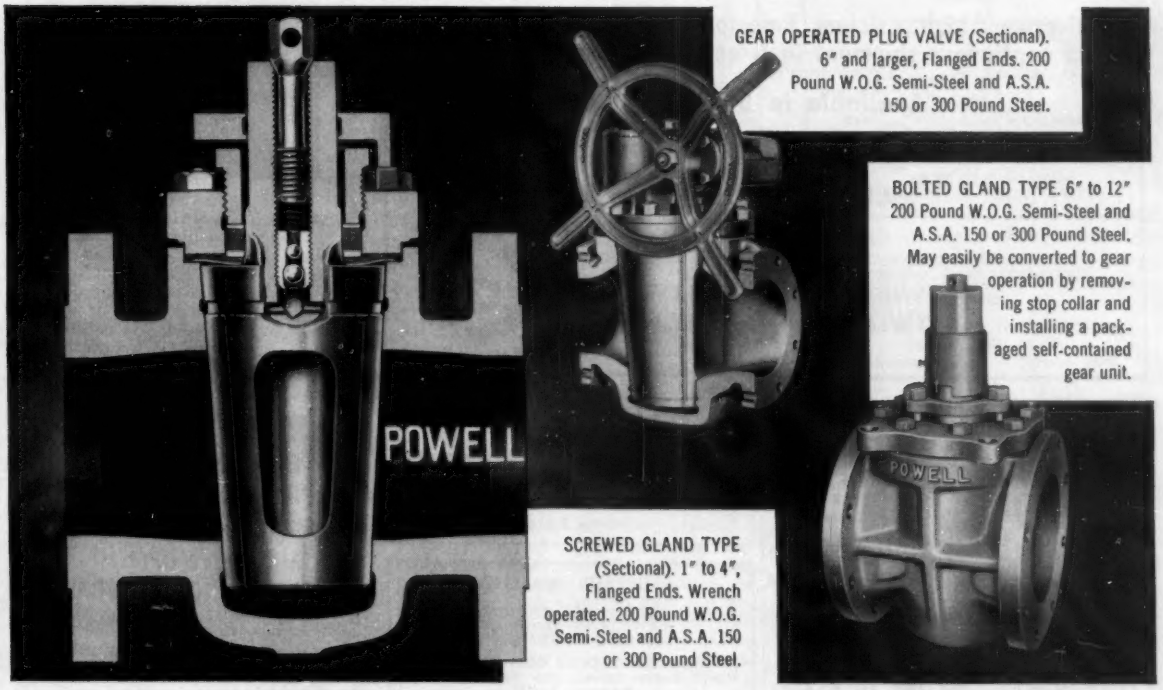

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Marco Flow-Master Automatic Processing equipment including Roto-Feed Mixers, KACR reactor, 200 GPM Kom-Bi-Nator, AC-500 homogenizer, feeder and pumps all stainless steel. Excellent condition, new in 1952. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

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Wyandotte Chemicals Corporation

Wyandotte, Michigan

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P 1548 Chemical Week
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the afternoon session. "Such technology", avered Marek, "will have a strong impact on both domestic and world chemical business."

He also pointed out how some comparatively new developments may become pacemakers in many allied chemical trades. The new synthetic "natural" rubber, for example, will aid in the continuing growth of the synthetic rubber industry, while low-pressure polyethylene will likely do the same for plastics.

Then there are, he added, the new tranquilizing drugs for mental disease, the new analogs of cortisone and the rapid expansion in use of tetracycline that characterize progress in the pharmaceutical industry.

Gas vs. Turbines: How far off is the turbine engine? What effect will it have on some segments of the chemical industry? These were points covered by Esso Research and Engineering's vice-president in charge of research and development, W. J. Sweeney.

"Gasoline-powered passenger cars," he declared, "will still be the preponderant type 10 years from now, but an appreciable number of gas turbine cars will be in use. Turbines will eliminate need for many chemicals, but development of turbine engines might create a market for new additives designed to reduce metal corrosion and the formation of deposits on turbine blades.

Rounding out the afternoon session with penetrating analyses of their particular fields were Wilbur Miller, director of industrial applications, Fine Chemicals Division, American Cyanamid, on "Industrial Antibiotics"; George Harrington, Indoil Chemical's market research director, who spoke on "Oxo Process Chemicals"; and Robert Musser, market research department Carbide and Carbon, who discussed "Acetylene Chemicals."

Memorial Award: At the association's banquet, which wound up the New York meeting, Albert Forster, Hercules Powder's chairman and president, was presented the 1956 CMRA Memorial Award by C. P. Neidig, president of the group.

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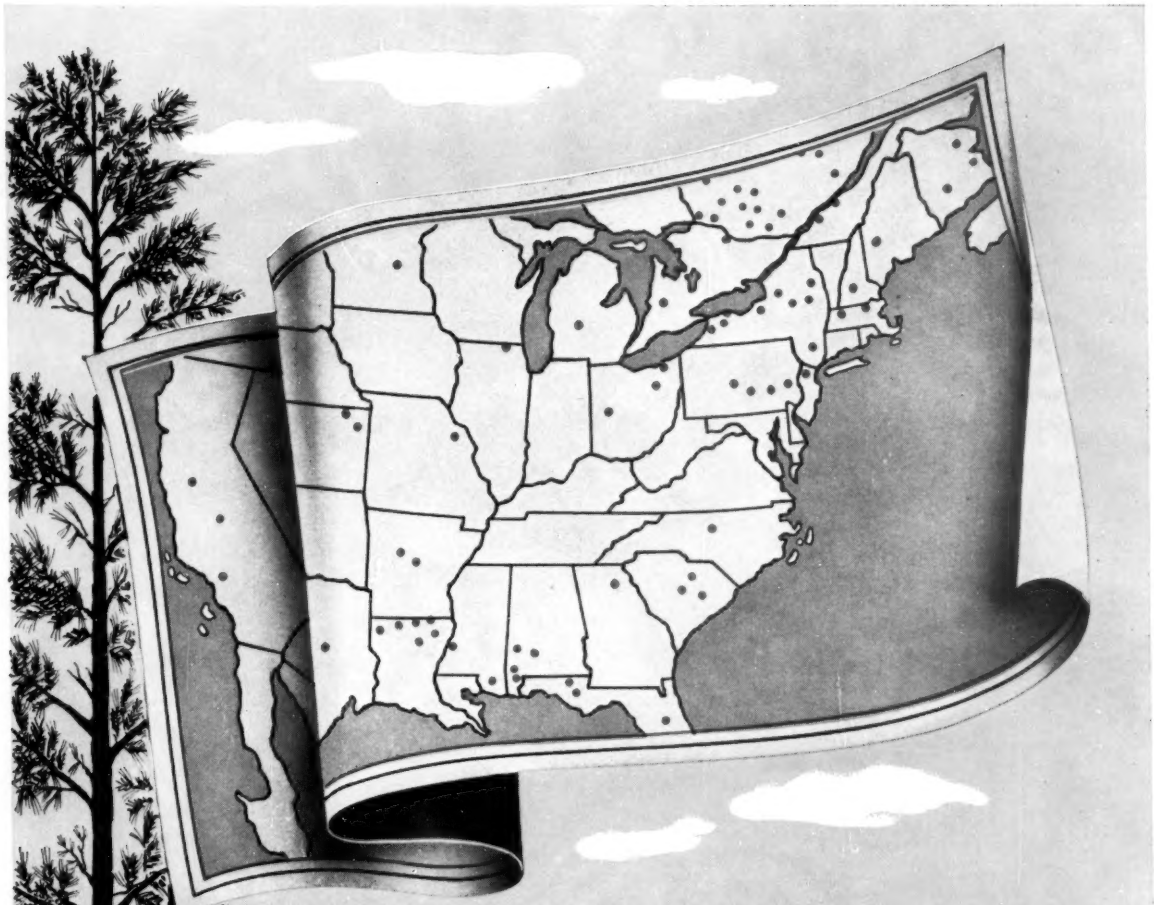

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